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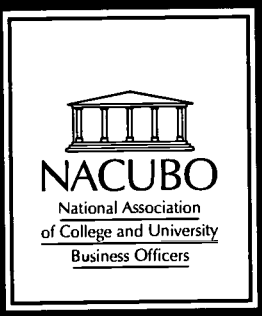
ABSTRACT

This monograph describes how team- and process-oriented change techniques such as Total Quality Management (TQM) and Business Process Reengineering (BPR), were adapted to an academic environment to effect a comprehensive change program at the University of California Santa Cruz (UCSC). The $3 million program, begun in 1993, produced radical changes and redesign of administrative functions from accounting systems to purchasing to information systems. The first chapter introduces the UCSC setting and introduces the concepts of quality process management, TQM, continuous process improvement, and BPR. The next chapter covers the first phase of the BPR process, assessment, which identifies specific change opportunities. The BPR tool kit--customer surveys and focus groups, process mapping, error analysis, technology mapping, and activity-based costing--are discussed in Chapter 3. Phase 2, selection of a financial information system and implementation planning, is covered in the following chapter. Chapter 5 addresses the implementation methodology; while the next two chapters discuss a case study involving the redesign of purchasing and acquisition functions; Chapter 8 considers organizational restructuring and changes in campus technology. Chapter 9 speaks to communication, managing risk, and human resources implications. The final chapter addresses the "Lessons Learned." (Contains notes and 16 references.) (CH)



Managing a Comprehensive Change Effort

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Preface

In early 1993, the University of California, Santa Cruz, (UCSC) began a massive change effort that has been transforming every aspect of the campus's administrative operations. These are by far the most sweeping administrative changes to take place at UCSC since it opened in 1965. From accounting systems to purchasing, from campus maintenance to fund raising, the university is radically redesigning administrative processes and information systems to make work more efficient, more cost-effective, and more satisfying. At the same time, UCSC is shifting the focus of its administrative mission from serving the needs of the bureaucracy to serving the needs of the "customers."

This comprehensive change program was triggered by a series of deep cuts in state funding for the University of California system, coupled with a climate of increasing competition and public dissatisfaction with higher education. At the same time, UCSC was struggling with outmoded, redundant, and cumbersome administrative systems.

Realizing that major changes were necessary, when UCSC's leaders recruited a new vice chancellor for business and administrative services in 1992, they sought someone with experience overseeing comprehensive organizational change in a college or university setting. I was hired on the basis of my work in administrative change at Oregon State University, and when I came to UCSC, it was soon apparent that the campus was beset with many of the same administrative problems I had faced at Oregon State. I recommended that the campus employ some of the successful change techniques of the business world to rethink and redesign campus operations at the most basic levels.

Using the team- and process-oriented change techniques adopted by private industry in the 1980s—including total quality management (TQM) and business process re-engineering (BPR)—UCSC is putting the campus's most basic processes under a magnifying glass and rethinking its core administrative operations from the ground up. The university is changing the very foundations on which UCSC does business—including not only its administrative processes, computer systems, and job tasks, but also the way people feel about their work and how their efforts are rewarded.

By the end of the 1994–95 academic year, the redesign effort—including hardware, infrastructure, software, staffing, and consulting—had cost the campus more than $3 million, not including countless hours invested by hundreds of staff members. However, when paper forms and redundant processes and systems are eliminated, expected by July 1996, UCSC could save up to $2 million annually through greater efficiency, timely payment of invoices, and bulk purchases.

Needless to say, this process has not always been a smooth and easy one. As with any institution, long-standing organizational structures and cultural attitudes stand in the way of change. Reshaping roles, structures, habits, and basic assumptions about work has been a challenge for everyone. These major changes in campus culture are succeeding only through the hard work of many dedicated staff and by the commitment of the top campus administration to the change process.

Dramatic as this process has already been, UCSC still has a long road to travel. While UCSC is now radically redesigning its most basic core processes, all the work done on campus will likely undergo close examination to ensure that the institution is providing maximum service at the lowest possible cost. In fact, change at UCSC will never be complete. Built into the redesigned processes is the ability to continue adapting to changing customer needs, technologies, and budgetary realities. This increased flexibility will be made possible in large part by comprehensive and accessible management information generated by the newly designed systems, enabling UCSC to adapt quickly to changing needs and conditions.

This monograph outlines the experiences to date of those involved with changing the way UCSC does business.

Acknowledgments

This monograph was written in collaboration with executive assistant Catherine Faris and quality manager Linda Kittle and results from the work of many University of California, Santa Cruz, staff members. The following campus employees have been deeply involved in the critical change processes described herein; their contributions to the success of the campus's current endeavor have been invaluable: Karen Eckert, budget director; Catherine E. Faris, executive assistant to the vice chancellor for business and administrative services; James F. Hagler, physical plant director; Linda M. Kittle, quality manager and BPR project manager; Patrick L. LeCuyer, director, applications development and support; Lisa J. Rose, materiel/purchasing manager; Robert R. Rodriguez, director, accounting and business affairs.

CHAPTER 1

Change in the Wind

The winds of change are blowing at gale force in higher education. Events that once took decades to unfold now sweep by within years and even months. Individually, these events seem like unrelated strands in a tangle of chaos, but when woven together and seen as a whole, they form a tapestry of a new demographic and economic landscape for higher education.

—Caspa L. Harris Jr., President, NACUBO
1991 NACUBO Annual Meeting

A Crisis in Higher Education

The message is clear: If colleges and universities do not get a grip on their budgets and programs, the government or the market will. The challenge of the 1990s for higher education is to develop effective ways to preserve academic excellence and public confidence with far fewer resources—and to do so in the face of heightened competition and increased scrutiny from the public and from government regulators. As recent headlines in *The Economist* proclaimed: "Academia is the one bit of education in which America still leads the world. But for how much longer? . . . The 1990s are turning into the toughest decade in academia since the great depression."[1]

The current climate in U.S. higher education is one of budget deficits, rising tuition, poor public perception, reduced demand, and growing gloom. Students and parents are signaling that they have reached their limit in terms of tuition increases, and many are beginning to reexamine the value of the "product" in light of its high

cost. As an institution's customers demand more, it must improve the services it provides or lose its customers to other institutions.

Public higher education in California faces additional challenges, including repeated and severe cuts to the University of California system's state-funded operating budget. The University of California, Santa Cruz, (UCSC) campus sustained $15.5 million in permanent funding cuts from 1990 through 1994, an overall decrease of nearly 14 percent—all without a reduction in enrollment. Funding for administrative units was cut more than 21 percent. While the state provided 57 percent of UCSC's budget in 1989–90, it supplied just 43 percent in 1993–94. Campus enrollment is projected to increase by 50 percent over the next 10 to 15 years, with no indication that funding will increase commensurately. At the same time, the regulatory environment has become more complex and constituent demands have increased.

In this climate, UCSC found it critical to reduce administrative costs and preserve, to the extent possible, the resources dedicated to support the campus's academic and research mission. UCSC's initial response to state-funding reductions was to make piecemeal cuts wherever it seemed most feasible, with little programmatic planning. Most often, these were reductions in staff costs through early retirement and the freezing of vacant positions. This approach—cutting people but not work—made the situation worse. The same tasks remained to be done, but there was no longer enough hands to do them. Moreover, the hands that remained often did not have the skills required and were not in the positions where they were most needed. This situation threatened to undermine quality of campus services in all areas.

With its staff stretched so thin, UCSC looked for ways to streamline its administrative processes, but quickly ran into a number of problems:

- UCSC employees did not really understand how the university's systems worked and interacted with one another across traditionally established administrative "boundaries."
- In trying to prioritize budget cuts, administrators realized that UCSC's basic institutional priorities were unclear.
- The lack of easily accessible management information hindered administrative efforts to make decisions about how to change administrative processes.

Academic Units	90-91 Base	Reduction	% Reduction
Arts	5,554,700	774,800	13.95%
Humanities	10,642,900	1,039,800	9.77%
Natural Sciences	18,881,200	2,197,800	11.64%
Social Sciences	12,136,800	1,384,000	11.40%
Library	7,094,000	493,700	6.96%
Other	10,281,900	2,021,400	19.66%
		Total:	**12.25%**

Administrative Services			
Student Services	9,571,100	1,534,800	16.04%
Business and Administrative Services	11,434,900	2,715,100	23.74%
College Administration	2,105,200	1,021,800	48.54%
Chancellor's Office	2,645,600	499,300	18.87%
Other	5,383,900	1,116,900	20.75%
		Total:	**21.80%**

Figure 1: Summary of Permanent Budget Reductions, 1990–91 through 1994–95

- UCSC's paper-based, mostly manual, assembly-line processes could not be streamlined without major changes in technology.

These last two difficulties were indicative of a larger problem, one shared by many other colleges and universities. UCSC's primary business systems and electronic infrastructure were established when the campus was much smaller and before the computer age. These included a central batch-processing system that was slow and inefficient. Most campus systems and processes had evolved in a haphazard manner to meet one-time needs and the unique demands of the campus's spread-out physical setting, resulting in a maze of complex and redundant procedures.

The campus had no universal automated information-sharing system. Although there was a campus network, not all units were connected to it, and there was no central repository for data. The general ledger was run once a month, and paper copies were distributed by about the 10th day of the following month; this meant that information was never current. Purchase requisitions took a minimum of 10 days to process, required 8 to 10 approvals, and had an error rate of up to 95 percent.

To cope with these difficulties, some 300 separate shadow accounting systems had been set up across the campus, ranging from hand-written ledgers to simple spreadsheets to sophisticated accounting systems with programmed interfaces. Campus Facilities, for example, compiled information from as many as 17 separate computer systems.

Serving the Customer

If UCSC was to change its processes—and it was clear that this was necessary—what priorities would guide that change? As the university began to examine its basic priorities, it became clear that higher education, like business, must ultimately answer to its customers: students, faculty, staff, members of the community, alumni, legislators, and donors.

In the private sector, excellent customer service has become the primary factor in success or failure, and this is becoming true in higher education as well. Serving customers is a difficult premise for many in the academic community to accept, however. While faculty and administrators do ultimately serve students and the pub-

Internal and External

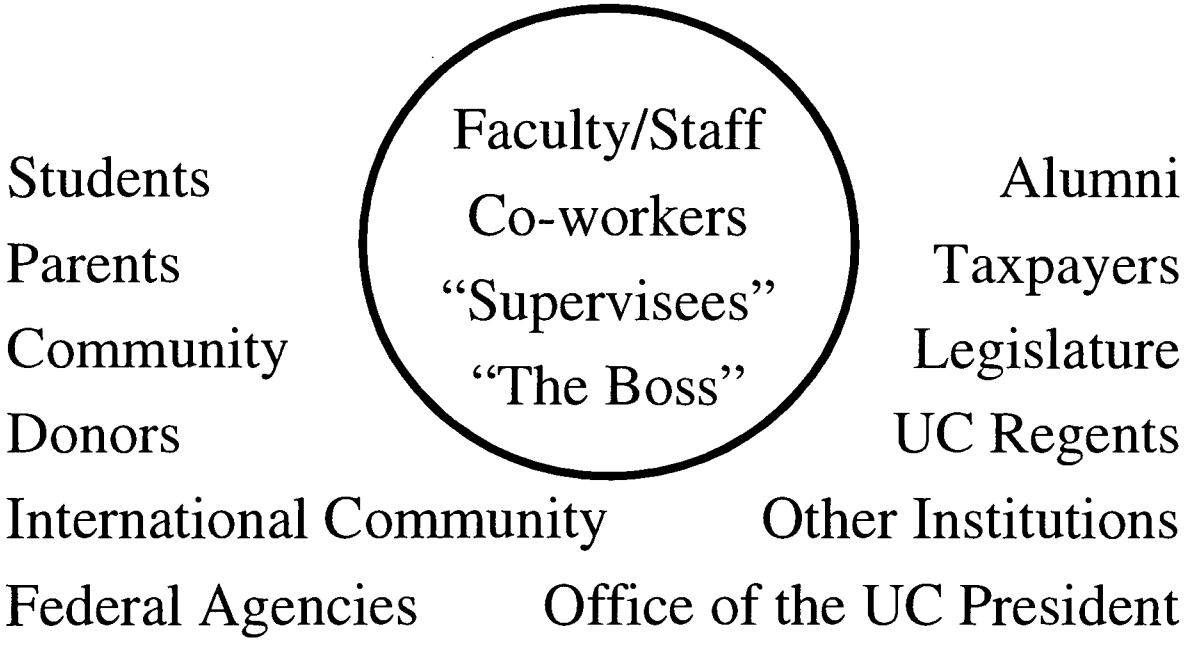

Figure 2: Who Are Our Customers?

lic, the concept of these services being customer-driven is perceived as a threat by many academics, and this perception stands as a major barrier to redesigning structures within academia.

Far from being a threat, however, the concept of creating value and passing it along to customers is a management approach that can transform rigid institutions into responsive, world-class colleges and universities. Creating value distinguishes between those activities that are truly essential from the customer's perspective (i.e., have value) and those that are not essential to the customer and should be minimized over time. When tuition was heavily subsidized, almost any level of teaching was considered valuable, but with the cost of tuition skyrocketing, that value is now being scrutinized and questioned. To be customer-driven, higher education must be able to read its customers' minds, give them caring, personalized service, and provide them with the knowledge and skills they need to be successful. These customers should feel that they have received exceptional value for their dollar, and that is no small task.

UCSC's primary customers, the present and future generations of Californians, have new and different needs from the students of just 20 years ago. The cultural and ethnic composition of the state has changed profoundly, and that change is continuing. UCSC must listen to its various constituent groups and focus its efforts to retain their trust as the 21st century approaches.

Because the needs of UCSC's constituents continue to change, any changes the institution makes in its operations must be part of an ongoing, flexible approach that will allow the campus to adapt to evolving customer needs. UCSC must, in the words of Peter Senge, become a "learning organization" that can effectively meet changing economic conditions and customer demands so that it can continue to provide top quality research and teaching for which the University of California is known.[2]

Business has already learned many of these lessons. Motivated by a lack of competitiveness with Japanese industry in the 1970s and 1980s, U.S. companies are now using many of the customer- and quality-based techniques that led to Japan's success. Following the principles of W. Edwards Deming and others, U.S. business has instituted radical organizational changes. Now 70 percent of Fortune 500 companies use techniques such as total quality management (TQM) and business process re-engineering (BPR) to help them anticipate and respond to rapid market changes.

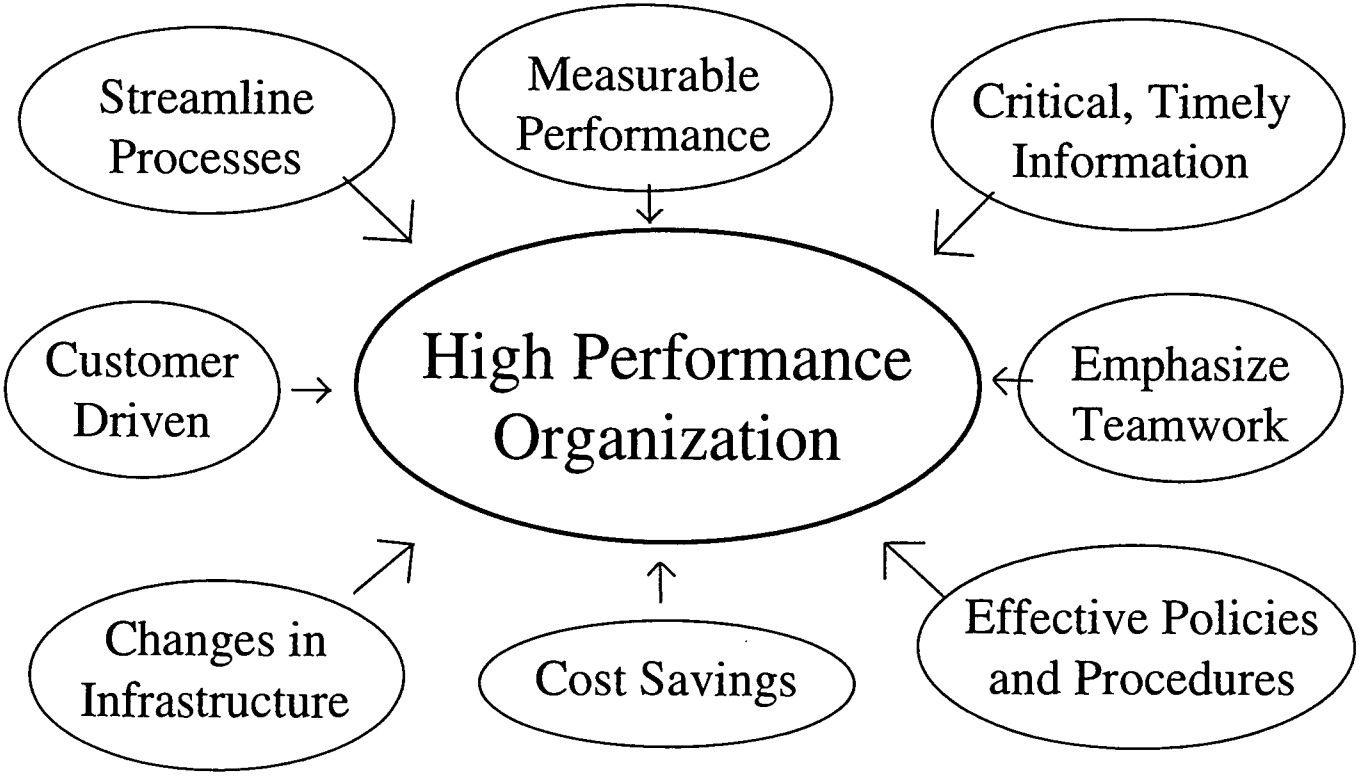

Figure 3: Becoming a High Performance Organization

In order to continue effectively fulfilling its mission of instruction, research, and public service, UCSC needed to apply these same techniques. As part of this process, UCSC needed to ask itself what it could afford to be. The university needed to focus on selective excellence and quality, on rightsizing itself to economic and qualitative realities. It needed to make hard choices about its institutional mission. A university campus cannot be everything to everyone; it must develop a clear and specific mission and find ways to fulfill that mission better than others. As a public institution, UCSC needed to make these decisions within the context of its public mandate: to serve the education, research, and public service needs of the people of California.

While higher education faces serious challenges, this crisis can also be seen as an exciting opportunity for positive change. The critical nature of the situation creates a unique opportunity to make difficult choices and weakens some of the traditional resistance to new approaches. The higher education "industry" is ready for change.

The UCSC Campus

The University of California, Santa Cruz, campus is located on the central coast of California, 75 miles south of San Francisco. UCSC was opened by the University of California in 1965 on the site of the historic Cowell Ranch. Its 2,000-acre site is one of the most spectacular on the coast of California, with a mix of redwood forests, deep canyons, and sweeping meadows overlooking Monterey Bay. The campus is a major sponsor of the Monterey Bay National Marine Sanctuary, and is leading the way as this region becomes an international center for marine and environmental education and research.

The UCSC campus currently has just over 10,000 students, including approximately 1,000 graduate students. Plans call for 12,000 undergraduates and 3,000 graduate students by 2005. UCSC has granted more than 38,000 bachelor's degrees, more than 2,200 master's degrees and certificates, and more than 1,300 doctoral degrees. The campus has about 400 permanent faculty, augmented by additional teaching staff as required. About 30 percent of the permanent faculty are women, and 20 percent are minorities.

Based on the collegiate model of Oxford and Cambridge, UCSC's campus has eight residential colleges—each with its own intellec-

tual, cultural, and architectural identity—arranged around a central administrative core. The colleges create close undergraduate educational communities in the midst of what has become a major research university.

The campus is organized into five divisions: Social Sciences, Natural Sciences, Humanities, Arts, and Graduate Studies and Research, each headed by a dean. The campus offers more than 40 undergraduate majors and 22 fields of graduate study. In 1994, the most popular undergraduate majors were, in descending order, psychology, biology, literature, art, and marine biology.

UCSC is internationally known for its research and graduate programs in marine sciences; astronomy and astrophysics; earth sciences and tectonics; molecular, cellular, and developmental biology; computer and information science; computer engineering; environmental studies; and developmental psychology. A national survey from 1981 to 1991, conducted by the Institute for Scientific Information, ranked research by the UCSC faculty in the physical sciences first among public universities, third among all universities, and sixth among all research institutions on the basis of per-paper impact.

As of October 1994, the campus had nearly 3,900 employees, with 2,300 of them nonacademic staff. The annual budget in 1993–94 was $196.7 million, with approximately 55 percent going toward instruction, research, and public service, and 12 percent going toward administration and maintenance. Approximately 43 percent of UCSC's revenue comes from the state of California, 20 percent from student fees, and 18 percent from the federal government.

Quality Process Management

In the past, quality in education has been linked to the quantity of resources an institution has and to its reputation. Now these assumptions are changing, and new ways are needed to assess the outcomes of higher education. How is quality in teaching, research, and service measured? Can curricula be restructured to be more effective? Can the time it takes for students to earn a degree be reduced? How can internal administrative services be improved to better support the campus's academic and research mission? Can new hires be processed more quickly? Can bills be paid faster?

Money alone will not provide the answers. One approach that begins to address these issues is a focus on customer needs to determine quality. This approach is at the heart of the management techniques introduced by W. Edwards Deming in Japan in the 1950s and popularized in the United States by Michael Hammer and James Champy in the early 1990s.[3]

Deming realized that businesses in the United States were not organizing work effectively. His research found that 85 percent of the problems in organizations were occurring in processes, not people, and he began developing ways to change those faulty processes. This idea presented a problem for U.S. business because most work has traditionally been organized in terms of tasks, jobs, people, and management structures—not processes.

But what exactly are processes? A process is a sequence of activities that is intended to achieve a result: that is, to create added value for a customer. There are over 150 processes in a typical college or university. There are academic processes, which include teaching, research, technology transfer, and tenure giving. There are auxiliary processes, such as food service, child care, mail service, and book sales. And there are business and administrative processes, such as fund raising, hiring, assigning space, allocating money, cleaning and maintaining buildings, and distributing payments. These processes are almost never confined to a single "department," making it difficult to make meaningful changes without involving the entire organization.

Process management asks university administrators to realize that customers pay their salaries—and that universities must provide a product or service that meets or exceeds customers' expectations. Administrators must recognize that they are paid for value created and learn to measure their outputs based on the value they provide the customer. In conjunction with this customer focus, Deming pioneered a team approach to process management, in which all employees accept ownership of problems and participate in solving them.

Since the 1980s, U.S. business has been eagerly adopting these process management methods, including TQM and BPR. TQM is a method that results in a series of small, incremental changes that significantly improve processes over time. While TQM is effective for processes that need some repair, BPR is the appropriate method

for processes that are seriously "broken," those which need to be rebuilt rather than mended.

Higher education seems to be one of the last bastions of resistance to the new customer and process focus, but there is evidence that this revolution is finally penetrating this change-resistant "industry." A new change model based on TQM and BPR is evolving on campuses like Oregon State University, UCSC, and the Massachusetts Institute of Technology (MIT). This emerging model, which can be called quality process management (QPM), is a disciplined, structural approach designed to meet or exceed the needs of the customer by improving the efficiency and effectiveness of processes. It places the customer at the top of the organization and incorporates the following:

- Use of information technology
- Less specialization, combining previously fragmented, piecemeal tasks so staff can take responsibility for larger, more meaningful chunks of a process
- A flatter organizational structure, with decisions made closer to the point of actual customer service

Effective use of computer technology is the key to this approach. New technology makes it possible for valueless and redundant steps to be removed from processes and provides automatic, systemic controls to replace time-consuming hierarchical authorizations—all without compromising security, accountability, and confidentiality.

UCSC, like most campuses, has focused on keeping up with rapid changes in information technology, but has not made the process and organizational changes needed to make the new technology most effective. A basic premise of BPR is that one does not "repave the cow paths." In other words, simply automating cumbersome and outdated procedures will not fix faulty processes. For example, information technology can replace multiple data-entry processes with one-time entry that provides access to all users, freeing them from repetitive work to concentrate on meaningful analysis and strategic planning.

Today's universities and colleges, as well as most private-sector companies, were built around an earlier management model based on the division or specialization of labor and the consequent frag-

mentation of work. The larger the organization, the more specialized and fragmented the work. This model is hierarchical, procedural, and dependent on complex procedures and a narrow delegation of authority. The problems associated with this model include the following:

- Substantial organizational layering or hierarchy
- A high reliance on paper and forms to document decisions and transactions
- Excessive points of control
- Excessive redundancy of operations

For example, in higher education, the registration, admissions, purchasing, and facilities management offices typically assign separate staff to process standardized forms. The staff enter data and pass the forms on to supervisors for approval. Supervisors send the forms to another office for more data to be entered. No one completes the entire job; they just perform piecemeal tasks. As these processes evolve over time, an astonishing amount of the work done—50 percent or more—is redundant or unnecessary; it adds no value to the "product" that UCSC produces. UCSC's administrative processes embodied these structural problems.

In addition to incorporating new information technology and a new approach to processes, QPM restructures traditional specialized, hierarchical processes by delegating responsibility and authority to the level where the customer interacts with the institution. It encompasses a set of human resource strategies that specify expected employee behavior and reward risk taking, initiative, personal accountability, collaboration, and customer service.

Total Quality Management and Continuous Process Improvement

While some of UCSC's administrative processes were determined to require the major overhaul provided by BPR, TQM (also known as continuous process improvement) is being used for those processes that are not "broken" and can be improved by less drastic means. TQM is a structured system for creating organizationwide participation in the planning and implementation of a continuous

improvement process that exceeds the needs of the customer. It is a continuous effort that produces improvements gradually. Such incremental change—many small, easy changes made over time—can produce a large impact on an organization.

Most processes contain at least 30 percent non-value-added work (work that is unnecessary or does not add value for the customer). UCSC's experience has shown that more than 70 percent of work processes in academic institutions can benefit from TQM's incremental process improvement. Results show an average cost and cycle time reduction of approximately 10 percent per process over a three-year period. TQM is also useful, after BPR is concluded, to fine-tune new processes.

Continuous process improvement teams—the heart of TQM—are based on the premise that better solutions emerge when the staff involved in a process work to solve problems; they are, after all, the experts. The team examines a process that can be improved by the more-effective use of resources they already control. Each team includes a team leader (most often the supervisor of the process being reviewed), a facilitator/trainer, and no more than 10 team members. The team sponsor (usually the team leader's boss) ensures that the team's work is guided by the overall campus vision. Solutions are accepted and implemented more quickly and are longer-lasting because the people affected have helped develop them.

Based on an initial identification and analysis of customer needs and problems, the TQM team selects one major problem to work on, with improved customer service as the goal and measure of ultimate success. Based on a detailed process analysis and on brainstorming, the team selects possible solutions, implements them, and monitors their success. Those that work become standard operating procedure. This is a continuous activity; when one problem is solved, another is tackled.

At UCSC, TQM teams have tackled problems in the ad hoc faculty review process, in faculty resource budget and provision control, in the chemistry lab supply process, in travel accounting, and in the student check-disbursement process, to name just a few. UCSC has found TQM to be inexpensive to undertake and relatively quick to complete, while achieving significant improvement. TQM training on campus has been ongoing since the fall of 1992, and has provided the campus with knowledge of the fundamentals of both TQM

and BPR. While the campus has recently been focusing its energy on BPR, TQM will be a crucial part of fine-tuning the new processes to maximize ongoing and successful operations.

Business Process Re-engineering

BPR is the fundamental rethinking and radical redesign of business processes to achieve dramatic improvements in critical measures of performance, such as cost, quality, capital, service, and speed. The most creative part of the QPM model, BPR is a team-oriented activity that demands imagination and vision. While TQM is an effective remedy for some less-flawed processes, BPR is the change technique prescribed for processes that are seriously "broken." Some have described BPR as simply "starting over."

Overall, BPR's goals include reducing costs, making effective use of the latest available technology, and generating accurate management information to allow continued adaptation to changing conditions. For higher education, BPR means asking the question: If we were recreating this institution, given what we now know and given current technology, what would it look like? Team members are asked to forget about the rules, regulations, policies, and commonly held institutional values, go back to the beginning, and invent a better way of doing things.

Although many corporations are using BPR, only a few universities have had real experience in this area. UCSC is using a body of BPR techniques adapted for higher education by campus BPR teams and the management consulting firm of Coopers & Lybrand, a pioneer in applying BPR in both industry and academic institutions. UCSC's experience continues to be encouraging: Estimates indicate that, given intelligence and imagination, these techniques can provide cost savings of 10 to 30 percent in one to three years.

BPR is accomplished through a well-planned and integrated effort that includes the following basic steps:

- Phase 1, Assessment: The purpose of Phase 1 is to verify that change is needed and to assess the way an institution currently does business. A campuswide team, made up of campus managers and key people from key processes, identifies, analyzes, and evaluates core campus processes—those that cross formally constituted campus units—using the criteria of volume, cost,

customer importance, customer satisfaction, and the use of modern information technology. Based on this analysis, some processes are recommended for BPR and some for less drastic change using TQM.

- Phase 2, Redesign: Redesign teams are formed for each of the processes slated to undergo BPR. The processes are analyzed in much greater depth—essentially put under a magnifying glass—and the teams brainstorm new and innovative ways to provide the needed services to the customer. The result is a radical redesign of existing processes. Each team, working with a technical advisor and a team leader, determines information technology needs, gets top-level approval for the plan, and proceeds with planning for implementation of the new plan.
- Phase 3, Implementation: Based on the work of the process teams in Phase 2, the redesigned processes are implemented campuswide. This includes changes in administrative structure, as well as technology, and above all it requires changes in campus culture. The changes in this phase are deep and sweeping, including implementation of new information technology.
- Phase 4, Harvest: The campus is now able to reap the benefits of BPR, including reduced costs, increased customer service, and increased worker satisfaction. Phase 4 also focuses on fine tuning new processes so they work smoothly on a day-to-day basis. Implementation should achieve 80 percent of the goal, while continually reassessing, reevaluating, and adapting processes to daily needs should take the organization the rest of the way.

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Figure 4: The Four Phases of Business Process Re-engineering

Phase 1, Assessment: March–May 1993

Overview

UCSC began QPM in the spring of 1993 with a "discovery phase" that laid the groundwork for change. Teams of campus staff were formed to guide the change process. At this stage, the campus articulated a broad administrative vision to guide change, then proceeded to analyze current processes in light of that vision. This analysis also included the following:

- Identifying and prioritizing opportunities for radical change
- Assessing current technology use and needs
- Creating a business case for change
- Securing a formal decision to proceed to Phase 2

In addition to helping determine needed changes, the data gathered in Phase 1 provided baseline measurements to evaluate the ultimate results of campus change.

UCSC's vice chancellor for business and administrative services functioned as the campus change agent, overseeing and guiding this endeavor. The person in this role should have sufficient authority to make decisions and to communicate with top administrators as the process proceeds. As Hammer and Champy note, the change agent should have "enough authority over all stakeholders in the processes that will undergo re-engineering to ensure that re-engineering can happen."[4]

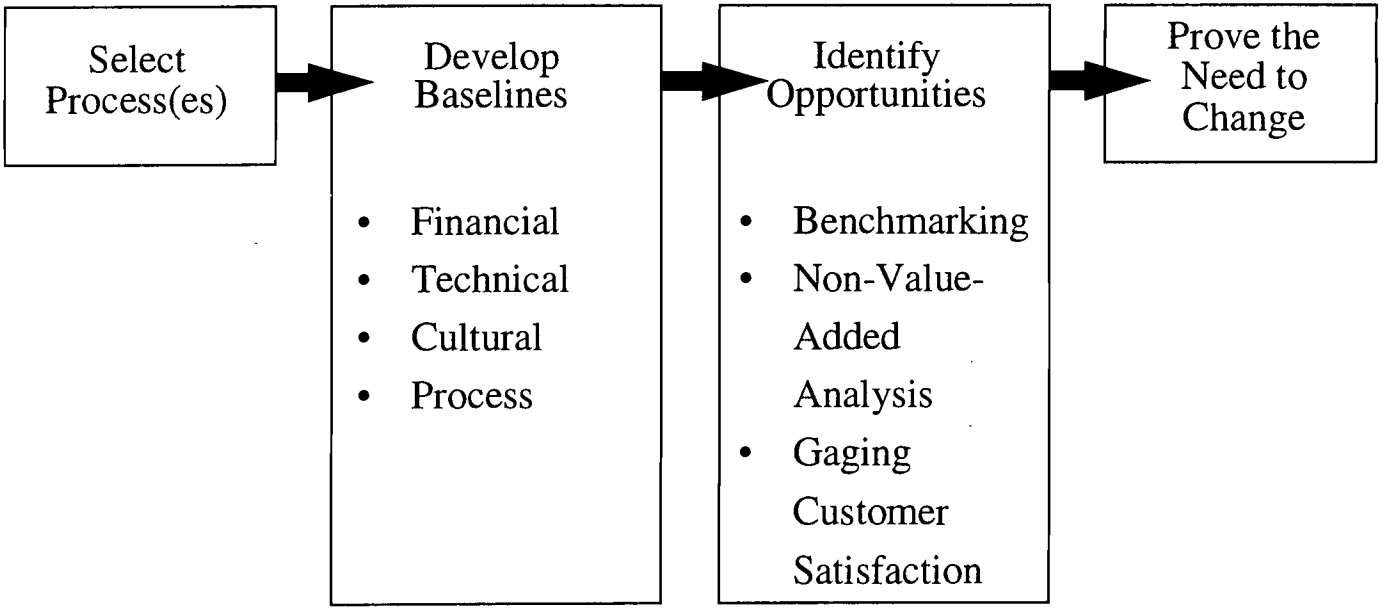


Figure 5: Phase 1, Assessment

Organizing Into Working Teams

Initiating QPM was UCSC's Executive Steering Committee, a team of top-level campus administrators that included vice chancellors, deans, and a faculty representative. The group reached a consensus that the administrative status quo was unacceptable and that a major change effort was to be undertaken. The Executive Steering Committee endorsed the administrative vision statement that guided the campus redesign effort and, based on recommendations from a wide range of working teams, advised the executive vice chancellor and the chancellor on all major QPM decisions.

Later in the process, a change management team, composed of a subset of Executive Steering Committee members, was formed to coordinate communication and human resources aspects of the change process, minimizing the disruption caused by major changes in campus life and culture. Changes in the way people do work can be very upsetting; alterations in job structure, responsibility, and organization can cause widespread insecurity and tension if members of the campus community are not adequately informed about it and prepared for it.

UCSC's change management team was created only after the need for this level of decision making became clear; in retrospect, the change management team should have been in operation from the beginning to help build a sturdy framework for campus change. For many institutions, a streamlining of processes may result in staff layoffs, and the change management team would ensure that appropriate retraining, placement, or other measures are taken. At UCSC, while changing job tasks often required substantial training, the previous two years of restricted hiring and early retirements allowed the campus to manage attrition and avoid layoffs.

The next step was selection of a campuswide core BPR team, which began with 20 staff members and eventually involved more than 75 staff members during the implementation. The BPR team was selected to represent the major functional areas on campus. It included, for example, the manager of internal audit, manager of accounts receivable, materiel manager, assistant academic vice chancellor, and director of administrative computing, as well as representatives from planning and budget, facilities management, the library, student services, and four of the five academic divisions. The team, which the vice chancellor initially led in Phase 1, was

turned over to a newly created full-time position of quality manager. This position was filled by a staff member who had both higher education and consulting experience at UCSC.

Selecting a Consultant

Initially, the campus core BPR team attempted to start Phase 1 on its own, but soon realized it did not have the skills and background required to do so. Therefore, the team decided to hire a management consultant to assist it in Phases 1 and 2 of the redesign process. A subcommittee of the core team developed a request for proposal for a consulting firm, and did the initial screening of applicants. Of six applicants, four were asked to make presentations to the entire team. Proposals were evaluated on the basis of the thoroughness of the plan proposed by the firm, the qualifications and experience of the individuals who would actually perform the work, and, of course, the cost. Information provided by current and previous clients was also a major factor.

The management consulting firm, hired in early 1993, actively supported the campus during Phases 1 and 2 of the change process. The firm began by training the core team in BPR tools and methods and went on to provide an overall planning framework for Phases 2 and 3. The firm continued working with the BPR team through Phase 2, assisting with training, facilitation, analyses, and—perhaps most valuable—keeping the entire process moving along smoothly. While the firm's assistance would have been helpful through the entire implementation phase, such services were beyond the BPR team's budget.

Initial Analysis of Campus Processes

During Phase 1, the cross-functional core BPR team met first as a large group then split into subgroups. The team's first task was to become familiar with the basic concepts and methods of BPR and to identify the key business processes underlying UCSC's functional unit structure. In evaluating how the campus accomplishes tasks, the team used a variety of tools to analyze work in terms of actual processes, rather then by the more traditional department or unit divisions.

The concept of viewing work by processes rather than by administrative function was new to most team members and at first led to some confusion. Training and exercises on process definition were very useful. When the team defined a process as a series of linked activities that adds value to an input and creates a service or product for a customer, it learned not to think of purchasing, but rather to focus on the process of acquiring goods. It looked at integrated financial transactions rather than at accounting and budgeting separately. Of some 150 processes on campus, the core team identified 19 critical processes to examine in more detail.

These preliminary activities had positive results beyond those expected. As the team brought together representatives of the academic and business sides of the campus, it began to understand the common concerns and to overcome the structural barriers (and at UCSC, the large physical distances) that had divided units and departments. The team developed a more global view and a true appreciation that the campus could not afford to continue the status quo.

Establishing a Vision for Change

An important element of Phase 1 was development of an overall vision statement to guide change, followed by translation of that vision into a basic set of campus goals. UCSC's administrative vision statement follows:

> Administration at UCSC will provide effective services to our customers: students, faculty, staff, and other constituencies. Staff, faculty, and students alike will save time and money from improved administrative functions. UCSC's administration will be largely decentralized, emphasizing teamwork and placing responsibility and accountability at the appropriate level closest to the transaction or client. Administrative processes will avoid needless redundancy and excessive controls. Technology will enhance communication at all levels of the institution. Services will employ modern technology at the lowest reasonable cost.

To realize this vision, the team developed the following goals to guide the BPR process. These goals also provide a means by which the success of the BPR effort can be evaluated.

- Design work around the needs of and inputs by customers
- Achieve substantial savings in administrative costs, measured by reduction of time on tasks and reduction of non-value-added activities
- Develop clear, effective, and accessible policies and procedures
- Anticipate and prepare for changes (technological, financial, demographic) that will affect how well the campus administration can support the university's mission
- Improve administrative processes (both radically and incrementally) to students, faculty, staff, and the public through continual evaluation of their needs and satisfaction
- Develop an information technology infrastructure that allows easy access to up-to-date information, reduces paperwork, eliminates wasteful redundancy, and provides simpler transaction processing
- Reduce central administrative overhead and ineffective internal controls by providing departmental staff with new authority, responsibility, tools, and training, and aligning responsibility of resource accountability
- Emphasize teamwork and individual performance to encourage staff to cooperate rather than compete, and modify reward systems to recognize team performance
- Develop appropriate campuswide, divisional, unit, team, and individual performance measures and utilize them as the basis for reward or corrective action

A Close Look at Five Core Processes

Through a close examination of the campus's most basic processes, evaluating factors such as cost, volume, customer satisfaction, and customer importance, the BPR team identified five core processes as prime candidates for redesign:

- Acquisition of goods
- Management of facilities
- Hiring of employees
- Recording of financial transactions
- Enrollment of students

Process	Output Volume	Resource Costs	Customer Satisfaction	Customer Importance
Acquire Goods	High	High	Low	High
Develop Budget	High	Medium	Low	High
Record Financial Transactions	Very High	High	Low	High
Manage Facilities	Medium	High	Low	Medium
Hire Employees/Manage Records	High	High	Low	High
Enroll Students/Manage Records	High	Medium	OK	High
Plan Curriculum	Low	Low	OK	High
Manage Contracts & Grants	Medium	Medium	OK	High
Request & Acknowledge Gifts	Low	Low	OK	High

Figure 6: Process Evaluation

The process BPR teams used a series of analytical tools to analyze the processes in terms of importance, volume, cost, and customer satisfaction, creating detailed profiles of each target process. They went on to compare their basic findings on the five processes, and three core processes were selected for redesign in Phase 2: acquisitions, financial transactions, and the work order process of the Campus Facilities Department. A recommendation was prepared—and accepted by the Executive Steering Committee and the chancellor—to move into Phase 2, a comprehensive redesign of these three processes.

About one year later, UCSC's University Advancement Unit (which includes development and alumni affairs), planning expansion and a shift in information technology, chose to redesign its processes, using the same tools and the in-house expertise of the Quality Management Office. This office consisted of the quality manager and her secretary, and the office reported directly to the vice chancellor for business and administrative services. Other operations likely to undergo BPR soon are the process used for admitting and tracking students and the process for recruiting, hiring, and tracking employees. In the longer term, the evaluation of all campus processes will likely become an ongoing and cyclical campus effort.

CHAPTER 3

Creating the Business Case: The BPR Toolkit

Because members of the BPR team were used to looking at work in terms of organized campus departments, they needed to better understand how the actual processes worked if they were to find the most efficient and cost-effective ways to redesign and reorganize them. This meant cutting across existing organizational boundaries—for example, following the process of purchasing goods and services from the department that orders the item, through the activities of the central purchasing office, through paying the bill.

Key to BPR are a number of tools for examining and analyzing processes—essentially taking them apart so they could be put back together properly. The team used these tools in Phase 1 of the BPR process to identify processes needing repair. In Phase 2, the team applied the same tools in more depth, examining in minute detail the processes slated for redesign.

These tools also allowed the team to assemble a detailed business case, essentially a cost-benefit analysis, that compared current processes with proposed redesigned processes. This enabled the team to estimate how much the change would save the campus and how long it would take for the investment to be repaid. It also factored in the relative benefits of error reduction and increased customer satisfaction.

These analyses provided essential concrete evidence to back up the team's recommendations to proceed with Phases 2 and 3: redesign and implementation. In the longer term, the extensive qualitative and quantitative data gathered provided a baseline against which to measure the performance of the redesigned processes. The tools used included the following:

- Customer surveys and focus groups
- Process mapping (including touch time, non-value-added activities, and lag time)
- Error analysis
- Activity-based costing
- Technology mapping

These tools help answer the following critical questions:

- What is being done in the process?
- Where is the work done and by whom?
- Is the work done manually?
- How long does it take?
- What are the costs?
- Is it all necessary?
- Can any of it be eliminated?
- What are the major bottlenecks?
- What is the quality and error rate?
- When and how does the customer interface with the process?

Customer Surveys and Focus Groups

Because BPR focuses on meeting the needs of the customer—or adding value for the customer—those needs are identified by listening to the customer. Customer surveys help identify quantitative customer needs, while focus groups target more intangible, qualitative aspects, such as satisfaction. The BPR team's goal was to identify those processes and subprocesses that were not adding much value for the customer.

In effect, the team needed to measure the gap between customer expectations and actual performance. Processes which had high output volume, high costs, low customer satisfaction, and high customer importance were candidates for radical redesign. Equally important was the perceived need for change by those responsible for the processes.

Process Mapping

Process mapping traces through the organization the path of a service or product request, which culminates in an output that is

delivered to an external customer or another unit in the institution. The objective of process mapping is to understand the existing process: the activities, inputs, outputs, resources, costs, and value-added work versus non-value-added work.

The process map (or flow chart) is a visual aid, a way of recording each activity in a process. To compile it, team members physically go to the department where work is originated and walk each activity through to observe and record the physical flow of the paperwork or product.

Once the process map is completed, the team members go back and add the touch time (the amount of time an employee actually works on the transaction) and the lag time (the amount of time it takes for the paperwork to go to the next step). They also determine which activities are value-added (activities required by a customer that the customer is willing to pay for) or non-value-added (those which can be eliminated by technology or are simply not needed).

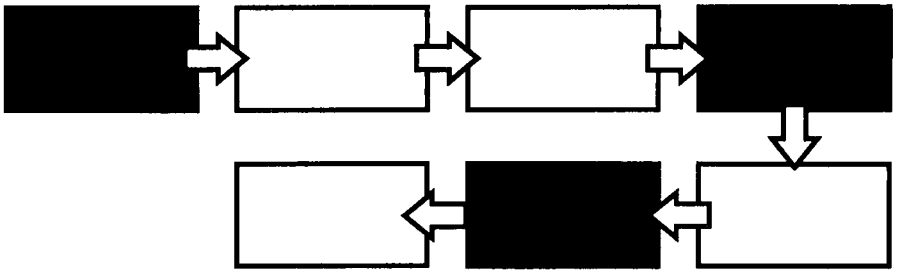
Error Analysis

Identifying the exact source of errors in a process is key to designing a new and more effective process. To identify errors, the BPR team compiled first-run yield sheets, which are summary sheets of errors occurring in the process being evaluated. Error was defined as incomplete, incorrect, or inconsistent information that prevented a processor from completing the procedure. A team member actually sat at a worker's desk, examining each transaction for errors and coding them by type. Once errors were identified, the team used a cause-and-effect or fishbone diagram to trace the root causes of the errors.

Using the fishbone diagram, the key issues and questions were summarized and dissected under the six categories of people, methods, material, equipment, environment, and policies. Once sorted into these categories, the specific cause of error was traced.

Technology Mapping

Maximizing available technology is an important aspect of BPR, one that requires an understanding of how technology is used in existing processes. Using interviews, surveys, and the process map, the team developed a one-page overview which showed what tech-



■ = Non-Value-Added Step

- Activity could be eliminated if some activity were done differently
- Technology exists to eliminate this activity
- Activity could be eliminated without impacting the form, fit, or functions of the product

□ = Value-Added Step

- Activity is required by an external customer
- Customer will pay for the activity

Figure 7: Development Process Map

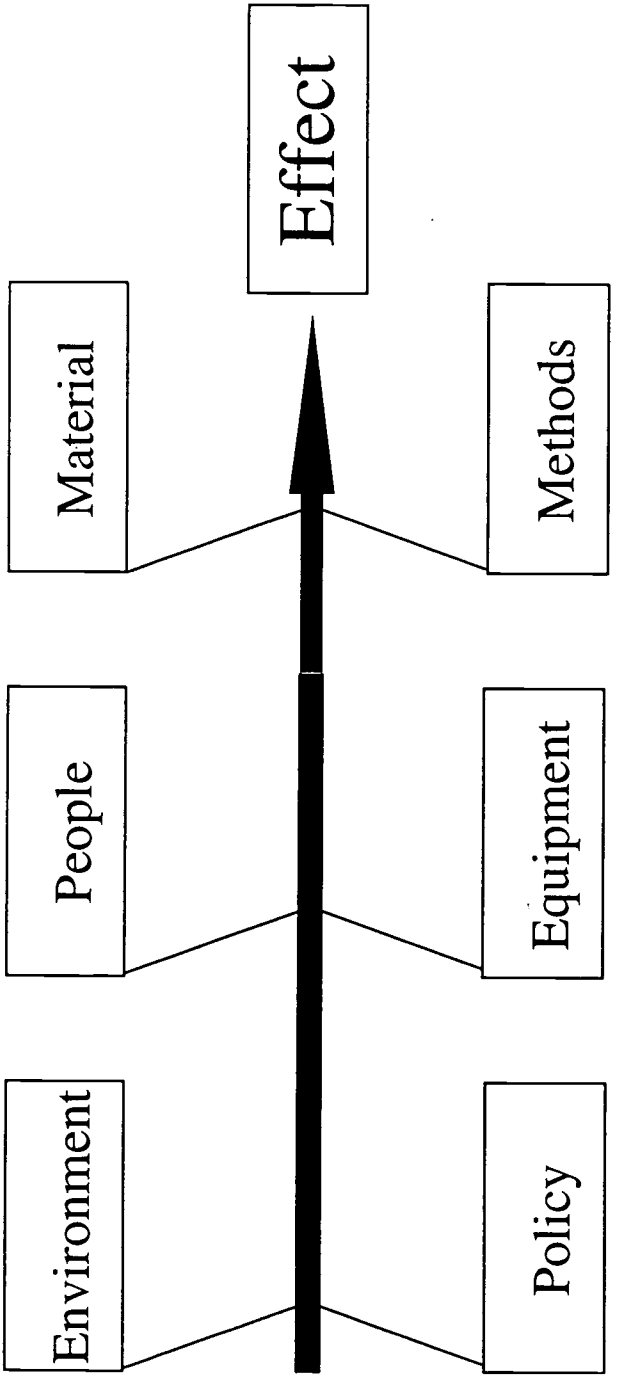


Figure 8: Fishbone Diagram

nology was used to perform each step in a process. This included such basic information as whether forms are filled out by hand or by typewriter, as well as what exact information technology systems are used for processing data. The technology map for UCSC's acquisitions process, for example, showed an extensive duplication of manual work, with forms typed and retyped, copied and recopied, and filed and refiled in various offices.

UCSC's technology infrastructure was outdated. Therefore, as a distinct and separate part of this analysis, the BPR team assessed the overall campus information technology situation, including networking capability and infrastructure and the capacity to handle newly emerging technology. The team also compiled a list of all hardware and software used on campus, both to guide change and to establish a technology baseline against which to measure future performance.

Activity-Based Costing

Activity-based costing enabled the BPR team to determine the cost of the original processes, even though the specific activities within the processes were done in a number of departments or units of the campus. Traditionally, cost is examined based on what each department spends. In redesigning processes, the team needed to measure the costs of all activities within a process and add them together to determine overall process cost. In addition, while the traditional way of looking at cost—by FTE enrollment—may tell what an institution pays for a certain activity, it does not serve as a basis for redesigning tasks. Through calculations that include touch time, lag time, the amount of non-value-added work, and the number and pay level of those involved, a cost is determined for each step in the process, and by adding these, for the process as a whole.

Using the data gathered, the costs of a redesigned process can also be projected. This is a key element in building the business case—comparing the cost and benefits of existing processes to the proposed redesigned organization.

Process	Current Costs						Estimated Savings
			Touch Time			Other Costs	
	Total Costs	Sample Evaluated	Total Costs	Non-Value-Added	Non-Value-Added		
Acquire Goods	$4.1	90%	$2.4	52% - 71%	$1.2	$0.5	$1.8
Record Transactions	$5.2	20% - 50%	$1.1	30%-100%	$0.9	- - -	$1.7
Manage Facilities	$7.4	42%	$0.3	9% - 23%	$0.06	$0.2 - $0.5	$0.8 - $1.1
Hire Employees	$3.4	38%	$0.3	11%-23% 81%-88%	$0.2	- - -	$0.5
Enroll Students	$6.2	71%	$1.1	- - -	- - -	- - -	- - -

Figure 9: Cost Assessment (in millions)

Phase 2, Redesign: Summer 1993

Goals for Phase 2

In Phase 2, the team redesigned the processes selected for BPR: acquisitions, financial transactions, and the work-order process of the Campus Facilities Department. The objectives for Phase 2 were to—

- redesign the three selected processes;
- conduct an assessment of campus information technology;
- select new information technology that would enable the planned redesigns; and
- begin changes in campus organizational structure to support change, including creating an ongoing communications plan, changing human resources policies and practices, and developing performance measures and policies needed to support the new customer-focused processes.

Phase 1 had resulted in several basic conclusions that would guide this work:

- The campus lacked access to timely, accurate management information, which resulted in excess cost.
- The processes included significant amounts of unnecessary labor resulting from excessive layers of approval, a lack of documented policies, antiquated systems, a high percentage of labor that did not add value to the product, and the fragmentation of processes among many departments.

- UCSC's information technology software was outdated, the result of years of underfunding and lack of a central strategic direction.

Different outcomes and benefits are anticipated in each process redesign, but each will generate either cost or labor savings and increase quality and customer satisfaction. In addition, each will provide increased access to timely management information, allowing the campus to adapt more easily to changes in technology, customer needs, and regulatory requirements.

The BPR Process Teams

Phase 2 began with the formation of BPR process teams (of 7 to 10 members) to conduct more in-depth analysis of each process and then redesign it. Each team included at least one member from the Phase 1 team (all of whom were trained in BPR techniques by the consulting firm) and was headed by a "process owner," a person who bears ultimate responsibility for managing the redesigned process.

Each team included staff working in the process, as well as staff from other units on campus to provide a fresh perspective on redesign. An effort was made to create teams that mixed people with different skills and approaches to problem solving and included those working at different levels in the process. These teams followed these basic steps:

- *Analysis of existing processes:* Applying the same tools used in Phase 1 plus the additional techniques of benchmarking and best practices, the teams analyzed the current processes in minute detail.
- *Innovation:* Each team determined the ideal characteristics of a redesigned process, brainstormed to come up with a wide range of alternatives, chose the best, and identified the overall changes needed to achieve it.
- *Redesign:* In the final redesign step, the teams specified the exact steps required to make the new process a reality, detailing the required changes in technology and estimating the costs and benefits of the change.

- *Obtaining administrative approval:* The teams (in a joint report) brought their findings and recommendations to the Executive Steering Committee and the chancellor for approval and a commitment to change the necessary structures and allocate the necessary funds.

Analysis of Existing Processes

The Phase 2 BPR teams used the same tools as in Phase 1, applying them in much more detail. More information was gathered from customers, and processes and subprocesses were closely mapped. The Phase 2 analysis added the additional BPR techniques of benchmarking and best practices. Benchmarking is an ongoing, systematic way of measuring and comparing the work processes of one institution to those of another. A comparison of costs, staff time, and other process measures helps set a realistic standard for expected improvements, and helps identify those institutions that are doing a good job.

The teams also identified best practices by researching the way similar processes are performed at other institutions. The goal of this technique is to gather good ideas from other units on campus, peer institutions, or even businesses. The teams first conducted research through libraries, databases, association lists, and networking to identify potentially fruitful sources, then planned and conducted in-depth phone interviews or visited the site to observe processes in action. The information gathered was incorporated into the process redesign.

Innovation and Brainstorming

This was perhaps the most critical point of the redesign effort, when the process teams—after being immersed for six weeks in the details of the process—began to consider how it might be redesigned. To enhance creativity, each team virtually locked itself in a room for a week of "visioning." All three teams conducted their visioning at the same time and at the same site. They trained and ate together, but went to separate areas of the building for working sessions.

A basic goal of these sessions was to encourage new modes of thinking and innovative approaches to problems. A number of

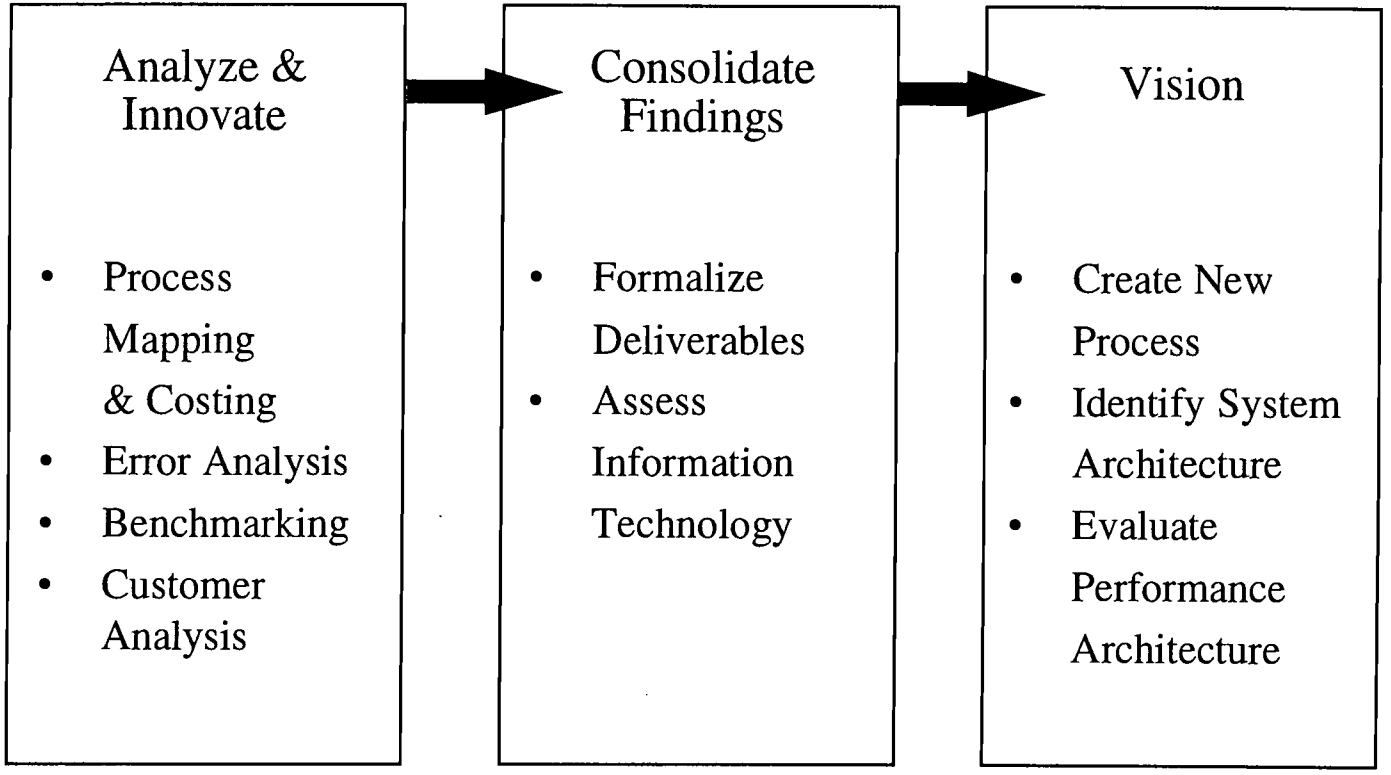


Figure 10: Phase 2, Redesign

games, creativity exercises, and other techniques were used. A good source for exercises to unleash creativity is *A Whack on the Side of the Head: How to Unlock Your Mind for Innovation*, by Roger Von Oech.[5] To help break people of one common habit, team members were required to put a quarter in a cup each time they said words like "We can't" or "Yes, but." The members of one team had $40 in the cup before they were finally able to change their behavior!

A few words of overall advice: If possible, these sessions should be held off site, away from the work environment, and the mood should be industrious, but fun. Humor is important. The Phase 2 teams kept toys and games available for breaks, and one team member taught others how to juggle—an apt metaphor for the redesign process. It is also important to feed people as they work! In fact, food proved to be a very important element of the UCSC BPR effort. While the periodic debriefing sessions elicited complaints about long hours, hard work, and frustration, there was consensus, at least, that the cookies were always good.

Redesign

Based on the information gathered and the overall vision generated in the innovation stage, the teams filled in the details of the new processes, redesigning them from the ground up to better serve the customer. This included specifying the exact technology and structure required to make the change possible, being sure to integrate the flexibility necessary to accommodate emerging trends such as increased revenue constraints, spiraling costs, organizational changes, increased reporting requirements, and changing customer needs.

Selecting the Financial Information System

A major part of UCSC's Phase 2 effort was the selection of a new financial information system. The campus proceeded with the search for new information technology at the same time it redesigned its processes. While this is counter to the "traditional" BPR model, close communication between the technical and BPR teams enabled the university to incorporate the findings on customer needs and process requirements into the request for proposal for the new financial information system. In hindsight, linking the system selection

Visioning Week at UCSC

One-half day: Setting the stage, setting goals, jarring traditional thinking patterns

- Kicked off with the film *The Business of Paradigms*,[6] followed by various creativity exercises

One-half day:

Brief review of data collected, including that from—

- mapping,
- error-rate analysis,
- benchmarking,
- best-practices review, and
- technology inventory.

From these details, the teams moved to describe the feel and overall attributes of the processes they wanted to create. As with building a house, one cannot start by drawing plans and laying a foundation; it is first necessary to describe the overall characteristics wanted: Will the house be light and airy? secure and cozy? a private retreat or a place for entertaining?

Two and one-half days: Describe and map the ideal process

Based on the overall attributes emerging from the previous day's work, the teams created a new general map of their ideal process. This included much brainstorming and discussion. The ball was kept rolling with a "parking list." Each time someone raised a question or objection that could not be easily resolved (such as, "Systemwide will never let us do that!") the teams would "park" it on a list and later assign someone to follow up on the issue.

One-half day: Implementation planning

The teams began initial planning for implementation, listing the steps that would be required and roughly estimating the costs and benefits of the new process. This included listing the next steps required and assigning tasks.

and redesign worked well, but it was done much too quickly. The Phase 2 work lasted just 14 weeks, when 20 weeks would have been a more workable time frame to complete both the redesign and a system selection.

The team charged with developing the blueprint for the campus's new on-line financial information system was a subset of the financial process BPR team. It began meeting in July 1993 to discuss the desired features of a new system, which were based on responses from customers and the overall criteria that emerged from the visioning sessions. UCSC needed an open system that would allow one-time data entry at the source of a transaction, make real-time data available to those involved in a transaction, and provide extensive management information.

The team incorporated these priorities into a request for proposal for the new system, and four university financial system vendors submitted proposals. As part of the final analysis, team members (with a consultant) made on-site visits to two campuses using systems under consideration.

At this point, UCSC faced the disappointing reality that the available information technology systems would not allow full implementation of the vision. There were high expectations for the redesign, and this was a depressing realization. No off-the-shelf system that integrated easily with a university fund-accounting system fully supported the open design envisioned for UCSC's business processes.

This led to a debate over how much modification UCSC was prepared to make in a system, and how much modification was, in fact, desirable. Two systems were under serious consideration; both only reached 60 to 80 percent of UCSC's vision. While changes might bring a system closer to that vision, they might make it more difficult to incorporate standard upgrades from the vendor. UCSC's ultimate decision was to make some modification to the standard "plain vanilla" system, rather than try to approach the "rocky road" of the vision, thus creating a "French vanilla" middle ground.

In choosing financial information software, it is important to look not only at the product, but also at the company itself. How does it treat its customers? Does its operational mode mesh with the institution's overall vision? When evaluating proposals for information technology systems, institutions should try to identify software companies that understand process redesign, are commit-

ted to delivering quality, and have undergone process redesign themselves. The overall quality of the vendor relationship is a crucial factor that can make or break the realization of an institution's overall goals.

The financial information system selected was technologically more modern than other options. It is a fourth-generation database written in C++ that will have in the future a client/server architecture. The alternative system, while more user-friendly on the acquisitions side, was mainframe-based. The cost of the system was approximately $1 million for hardware and software.

The new data system is based on a simple principle: information should be entered into a computer once—at the source. Managers approve or authorize transactions on-line, with reports and information available to those involved at each step in the process. The many paper approvals required by the old system gave staff the illusion of a safety net that would catch any errors they might make, but in fact the error rate was very high. With the new software, information is entered directly into the campus system, with the program providing a real safety net of on-line, real-time edit checks.

The software was first tested by staff. Necessary program modifications were proposed and prioritized, first to meet legal, University of California Office of the President, and government requirements, then to streamline processes, increase cost savings, and incorporate users' recommendations. Only the top priorities were addressed in the initial system implementation completed in July 1995; additional modifications will be reprioritized for implementation over the next year.

With the new system, only about 200 staff members at the service centers and central offices (such as accounting, purchasing, and budget) perform direct-entry tasks. An additional 50 to 100 staff members can access information, but not modify it. The basics of the system can be learned in several training sessions totaling approximately 26 hours; each process or form takes several hours of intensive hands-on training to master. UCSC's training sessions were presented and coordinated by a campus training team with the assistance of a contractor from April through July 1995. Between 150 and 250 employees have completed these training sessions.

Once the BPR team had completed redesign plans and selected a financial information system, it had to validate the original busi-

ness case for the campus administration to spend $3 million for equipment, software, training, and project support. This required extensive compilation and analysis of data. In the process, the senior administration requested an external review of the BPR team's findings—which validated the conclusions.

Completing the Work

Phase 3, Implementation: March 1994 to December 1996

Phase 3 involves the implementation of the process redesign recommendations. Some projects involve information system changes; others are focused on policy and procedure adjustments that can be made without a new information system. UCSC's goals for Phase 3 are to meet the original BPR goals stated earlier by providing—

- automated solutions for the support of process redesign;
- support for the decision-making requirements of the organization;
- immediate, broad access to relevant data such that departments may discard shadow systems;
- the support structure to sustain long-term process and cultural change; and
- a mechanism to enable cost savings campuswide.

In Phase 3, the implementation swung into high gear. The three process teams changed shape somewhat to include more full-time members from the central offices responsible for the implementation and to include the technical staff needed to support the implementation. Process users stayed involved to provide feedback on recommendations for change that the system could not accommodate. Users also assisted with the effort to prioritize overall deliverables when UCSC needed to scale back the project. The work of the acquisitions and financial teams eventually merged due to the joint focus on the implementation of the system. The work of the facilities team split into a separate track as it evaluated and selected a new computer information system.

In addition, a number of change-management support teams were established to assist with the infrastructure changes necessary to meet the cultural transformation the campus was facing. These were divided into five working teams:

- Human resources—to support training, campus restructuring, and any redeployment of staff
- Training—to create and implement necessary training programs at all levels, coordinating schedules and needs with the teams redesigning each key process
- Communication—to coordinate and implement an ongoing communication plan for the campus, working with the campus leadership to ensure as smooth a transition as possible
- Policies and procedures—working with the BPR teams to coordinate development and dissemination of the required changes in administrative policies and procedures, including formulation of overall guidelines for change and security-related issues
- Performance measures—working with campus administrators and process-redesign teams to coordinate performance measures for those performing the new processes, and to help develop campuswide measures tied to overall campus goals

In Phase 3, the processes redesigned in Phase 2—and the information system necessary to support them—are being implemented. The first step must be to carefully plan the scheduling of the change, while mobilizing the entire campus for changes that will affect everyone. One of UCSC's biggest problems was a lack of adequate project planning due to a variety of factors: inexperience of project leaders, absence of training for technical staff converting to the new system environment, and the complexity of merging system implementation and process changes. As it was, UCSC fell short by not developing an integrated plan with sufficient detail that was accepted and owned by all participants and that would carry the project through implementation. Instead, UCSC found itself having to replan every few months.

Figure 11 represents the methodology used at UCSC for implementation. It incorporates changes team members made along the way as they learned from their mistakes.

At the time of this writing, UCSC has accomplished its first major milestones: converting to the new financial information system,

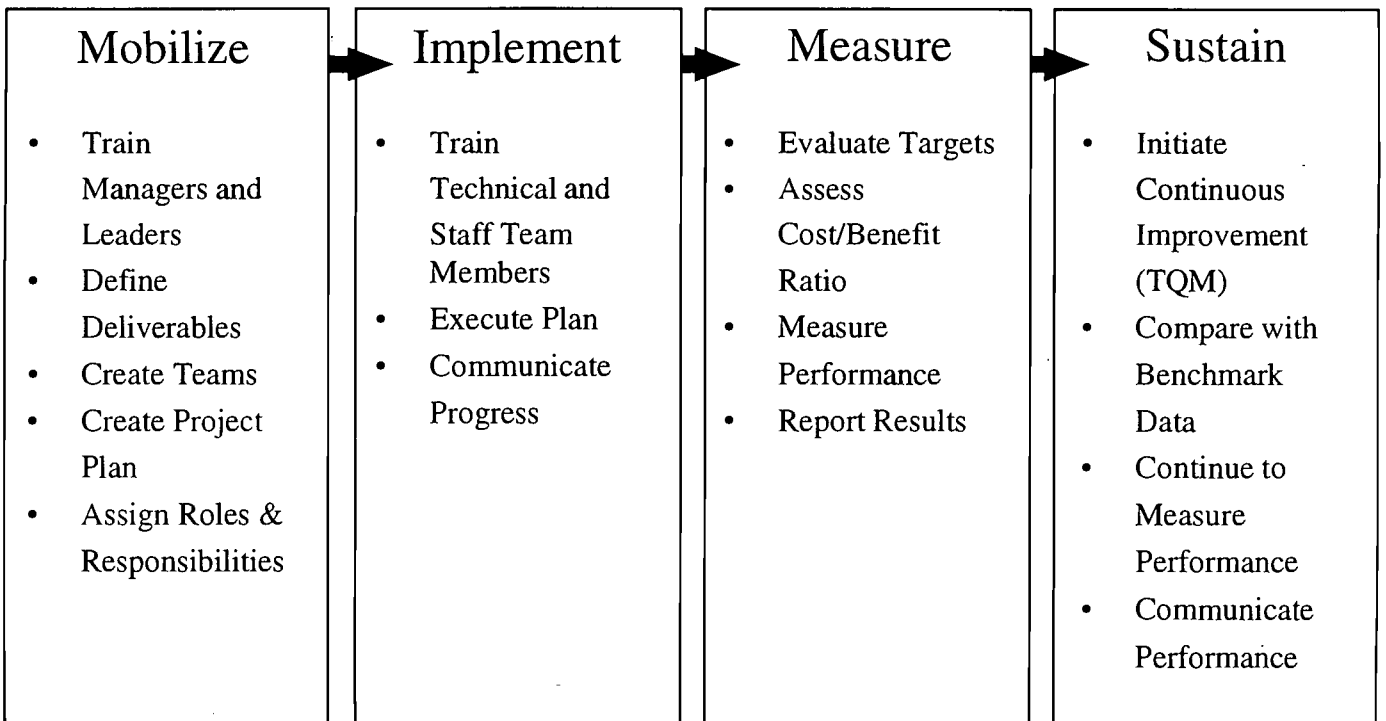


Figure 11: Phase 3, Implementation

changing most of the chart of accounts, and transitioning to a new technical infrastructure. At least another 18 months of work is expected before all redesign efforts will be implemented and results evaluated. However, in large-scale projects the importance of identifying measurable, attainable deliverables that can be achieved in phases has been confirmed and underscored for UCSC. It is essential to mark and celebrate each step of the process.

Phase 4, Harvest: January 1996

In Phase 4, UCSC will begin to realize the concrete cost savings and efficiency improvements that are the goal of all this hard work. However, processes in action may be different from the way they appeared in planning. In this phase, the new processes must be monitored and adjusted in response to real-world situations and the management data generated by the new information systems. At this point, TQM becomes an important tool for refining newly implemented processes.

The steps UCSC anticipates taking when beginning Phase 4 include the following:

- Assess results
- Measure performance
- Compare performance measures with original baseline measures
- Analyze results against original business case
- Establish new baseline
- Revise campuswide resource base
- Assign new budget allocations
- Set new performance measures by unit
- Communicate results
- Reinvest savings in next effort
- Begin Phase 1 of next project

Phases 3 and 4 will never be completely separate. For example, at UCSC, the implementation phase will last two and a half years (spring 1994 through fall 1996). The elements implemented early in the process will be assessed and fine tuned while others are being implemented.

The Processes That Were Redesigned

Acquisitions and Purchasing

After employee costs, the purchase of goods and services at UCSC represents the campus's largest area of financial activity. In 1992–93, purchases totaling approximately $30 million were made from more than 5,000 vendors, with few price-leverage or quality controls. The workload associated with acquiring the goods was approximately $4.1 million, with most of these costs incurred outside the Purchasing Office in time-consuming form preparation and processing. Approximately 700 people were involved in the process of requesting or receiving goods and services—with the time spent totaling 97 FTE employees. The process involved enormous duplication of effort, limited flexibility, and a tremendous error rate. For these reasons, and because purchasing is an activity that affects nearly every campus unit and constituency, acquisitions was identified as a core administrative process of the institution.

A more detailed discussion of the acquisitions and purchasing redesign process is provided in Chapter 7.

Financial Transaction Process

UCSC's financial transaction process was the second of the cross-functional core processes determined to be in serious need of repair. Customer focus groups were unanimous in their agreement that the campuswide system of recording financial transactions and information needed radical improvement.

There was a lack of formal interaction between financial systems both within the UCSC campus and between the campus and University of California Office of the President. With a few exceptions, there was no electronic interface between UCSC's individual unit systems and the campus system. The primarily manual system required staff to fill out forms, photocopy them, mail them around to other offices for approval, then finally send them to a central office for data processing and a marriage with a central database. A month later, the changes would be reflected in the campus general ledger.

As a result, units across the campus had developed their own separate record-keeping and management-information systems. The BPR process identified as many as 300 of these shadow systems, ranging in complexity from highly sophisticated processing systems to simple spreadsheets. The cost of processing transactions and maintaining these stand-alone systems was estimated at $5.2 million annually, involving 500 people and a total staff time of 120 FTE.

The redesign of UCSC's financial system is being accomplished with the help of the campus's new financial information system, which is also key to the acquisitions and purchasing change effort. The system routes transactions through a streamlined approval process, recording them in the campus financial record-keeping systems. This system was operational in key campus units on July 1, 1995.

With the new system, an employee at a service center enters the purchase requisitions, purchase orders, or other actions directly into the computer, where they immediately enter a central database. Managers have immediate access to the data needed to make business decisions, and accounting staff use their time and expertise analyzing data and designing reports instead of sorting data and correcting errors. The new process for recording financial transactions is expected to save the campus approximately $500,000 annually.

Work Order Process of the Campus Facilities Department

The physical planning, construction, and physical plant units (making up the Campus Facilities Department) oversee 3,157,580

square feet of space contained in 467 buildings and lying on more than 2,000 acres of land. Approximately 260 employees are responsible for operating, maintaining, and upgrading campus facilities, accounting for $7 million in annual staff costs. The responsibilities of Campus Facilities range from managing new construction projects to paying for purchased utilities to responding to the campus's approximately 11,000 annual maintenance requests.

The basic mission of Campus Facilities has not changed since it was established in the 1960s, but the size of the campus and the scope of work have increased dramatically. With this rapid growth, Campus Facilities lost contact with its customers and their needs. In focus groups conducted early in Phase 2 redesign activities, customers—principally staff from other campus units—rated the work order process dead last. Routine cost overruns, lack of timely reporting on project progress and costs, and a large work backlog were among their complaints, although actual work quality was generally rated quite high.

As with other processes targeted for BPR, these processes were highly manual, duplicative, and inflexible, and did not provide useful management information. Process mapping revealed that more than eight data entries and 14 separate manual or electronic storage systems tracked work orders, yet none of the databases were linked to provide up-to-date project tracking. No statistical information was recorded to help management assess cycle time and benchmark processes. All work orders required six approvals; 13 different people handled paperwork.

After the Campus Facilities process redesign plan is implemented, customers will have access to on-line daily or weekly project status reports. The new system will allow a customer in Oakes College, for example, to send an electronic work request to solve a lighting problem and later review the progress and cost of the job. The electrician will schedule the job and order the parts needed on-line, and the parts will be waiting at the Campus Facilities shop counter in the morning. Supervisors can control the unit's inventory (more than 4,326 part numbers) and track jobs according to site, type, and numerous other useful criteria. Finally, on-line performance surveys will be sent to the customer at the completion of the job. The selection of a software system for the new process was completed in June 1995.

Fund Raising and Development

UCSC's need for private gift support is greater now than ever before and will only increase as traditional funding sources diminish and constituent demands rise. Although not identified for redesign in the QPM process, UCSC's Alumni and Development Offices chose to undergo a BPR reorganization in conjunction with a planned expansion and replacement of their outdated alumni/development database and gift-processing system.

The goals of the alumni/development redesign include increasing the capacity to analyze constituencies and track potential donors and reducing non-value-added steps in the donor acknowledgment process. The Development Office is currently implementing the alumni/development financial information system, which will be integrated with the campus's new financial and acquisitions systems for cross-functional information sharing.

The Development Office BPR goals differ somewhat from those of UCSC's other three redesign efforts. While the other three are expected to reduce overall costs, the Development Office's process change may increase costs. However, this investment in efficiency, more useful data, and increased campus involvement in fund raising is expected to result in a significant increase in private gift support to the campus.

CHAPTER 7

Case Study: Acquisitions and Purchasing

Acquisition of goods and services was the first process selected for redesign at both UCSC and Oregon State University. The process UCSC used to purchase goods and services was typical in many ways of the core processes selected by the campus for radical redesign.

The acquisitions process contains four subprocesses: requisitioning, ordering, delivering, and paying. UCSC requisitions and purchases more than 87,000 items annually, with major customers including faculty, staff, students, and vendors. The campus delivers more than 39,000 orders and pays with some 88,000 checks. Service providers work in all campus units—a total in excess of 700 people and 95 FTE.

The Phase 1 process evaluation matrix (figure 6) showed the process to have high volume, high cost, high customer importance, and very low customer satisfaction. Baseline data confirmed that the cost of the processes was high, with $4.1 million expended annually. More than $40 million in goods and services were purchased without the benefit of comprehensive campuswide contract management to obtain lower rates.

Preliminary mapping of the process by the BPR team in Phase 1 indicated that the acquisitions process also had significant problems with duplication of effort and limited flexibility, and did not provide useful management information. Its completely manual processes resulted in lengthy turnaround time:

- The process totaled $2.66 million in touch time, with 52 to 71 percent of the work not adding customer value.

- Five to seven approvals were required for purchases over $500.
- It took 7 to 12 days to issue a purchase order to a vendor.
- Five forms, one an eight-part carbon, were required to collect the data.
- Error rates as high as 105 percent (more than one error for every form) were documented.

Initial focus group data indicated that a lack of consensus on the basic purpose and mission of the central campus purchasing organization contributed to low customer satisfaction ratings (4 to 8 on a scale of 1 to 10). Campus management and many departmental users saw the Purchasing Office as a controller of campus costs. On the other hand, smaller campus departments viewed the Purchasing Office as a provider of vendor and product evaluation services as well as a source of technical negotiating and contracting services. In fact, none of these services was being adequately delivered.

A more detailed examination of the acquisitions process was undertaken in Phase 2. The acquisitions redesign team (or "A" team, as it quickly became known) included staff and faculty selected from units across campus, such as deans' offices, department offices, business offices, and the Purchasing and Receiving Offices. The team leader was the campus purchasing manager.

Using a number of BPR tools, the acquisitions team collected data from various sources. Through more-extensive customer focus groups and surveys, they verified the Phase 1 finding that customer dissatisfaction with process performance was high. The team collected benchmark and best-practices data from a range of organizations (including other colleges and universities, Digital Equipment Corporation, and Hewlett Packard), from literature searches, from NACUBO benchmarking data, and from National Association of Purchasing Managers conference proceedings. Of particular interest in this research were mechanisms for electronic data exchange, both within and outside the institutions, approval structures, the tracking of customer sales factors, outsourcing versus insourcing, and the use of commodity codes.

A subgroup of the team mapped the subprocesses involved—such as accounts payable, receiving, and purchasing—in great detail. From the map, the team was then able to "cost out" the process, using a detailed formula that assigns cost to each step based on the time required, the transaction volume, and the classification level

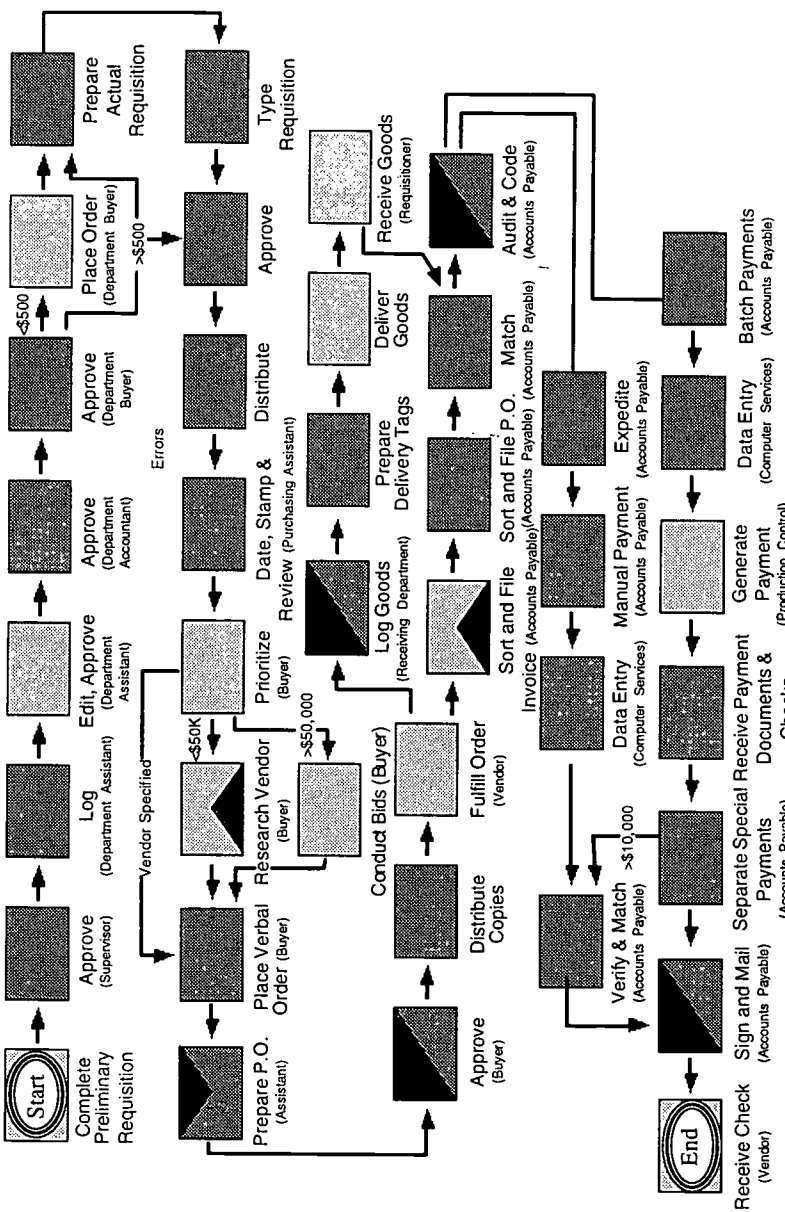


Figure 12: High-Level Goods Acquisition Process Map

of the person completing the task. The cost of the steps were added to get the total cost of the process. In addition, each step was evaluated to determine if it indeed added value (from the customer's perspective) to the final output. The analysis of these and other data led to the following results:

The process included much non-value-added work because of—

- multiple data entry,
- intensive paper use (printing, handling, routing, sorting), and
- multiple and redundant approvals.

The process included high lag time because of—

- physical movement of paper documents and
- lack of ability to forecast purchasing needs.

Potential for savings was identified in—

- one-time data entry at source,
- electronic routing, and
- single approval.

Following this data collection and analysis, the acquisitions team committed four full days, along with the other process teams, to visioning: thinking through the results and imagining a new future. The team's consensus was that the new process should—

- respond promptly to customer needs,
- produce cost savings and quality service,
- identify and even anticipate campus purchasing needs,
- foster and depend on strong partnerships with selected vendors,
- effectively track all campuswide purchasing activities,
- maintain simple and easy procedures,
- minimize controls and approvals,
- eliminate or dramatically reduce paper forms, with orders entered one time only at the very beginning of the purchase process, and
- allow for payment of vendors on time and accurately, leading to better vendor negotiations and relationships.

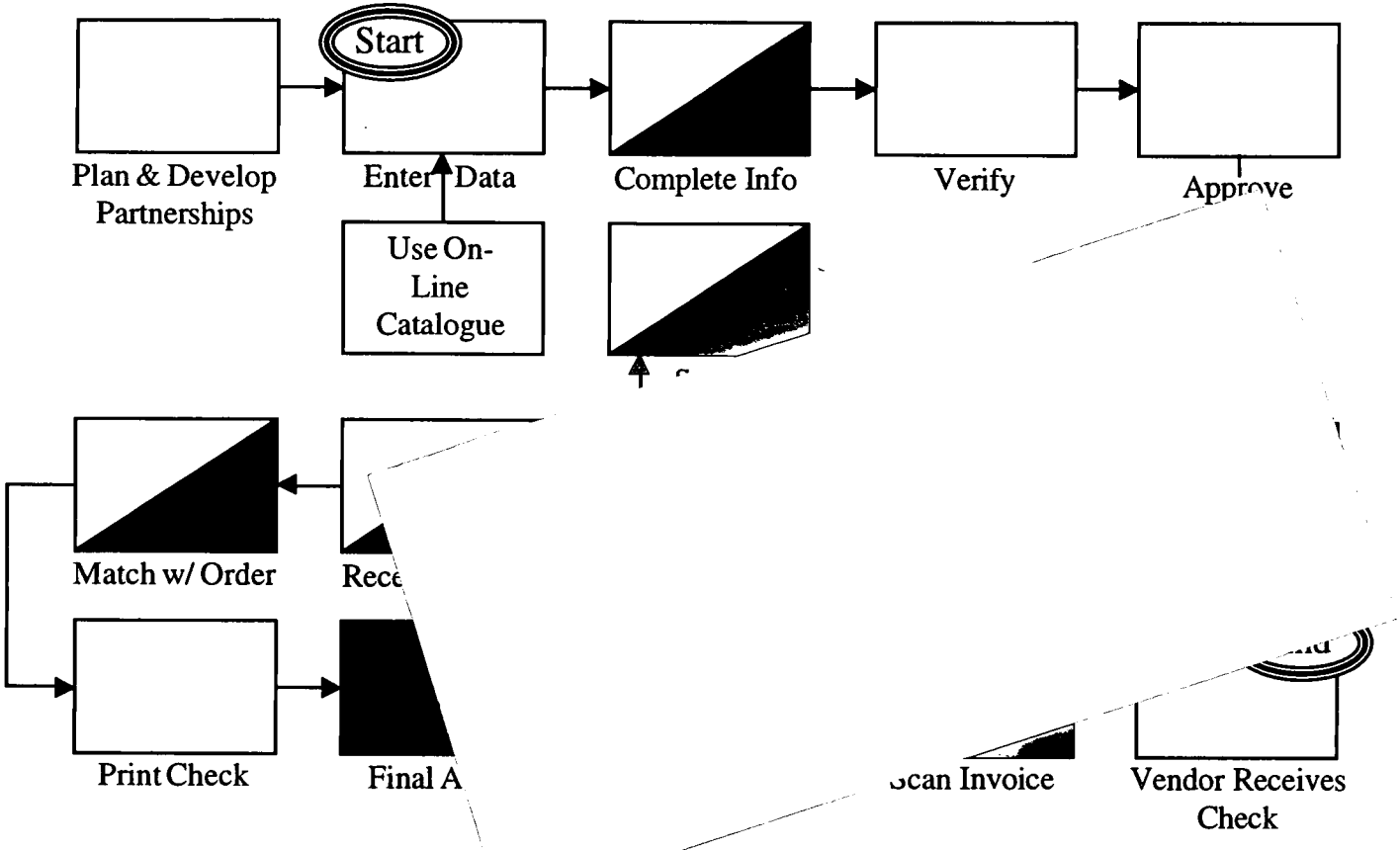


Figure 13: Core Process Ov ew High-Level Goods Acquistion Process Map

Based on these basic desired attributes, and drawing from the data generated by intensive mapping, the team redesigned the process and subprocesses to drastically reduce the number of steps required and to ensure that the new process would allow purchasing staff to anticipate and respond promptly to customer needs. The new design was a fundamental shift in operation from a control-oriented, paper-pushing office to a service-oriented, customer-focused entrepreneur with the ability to anticipate customer needs and have solutions already available. The redesigned process includes the following:

- Ongoing and up-front identification of customer needs to ensure that contracts are negotiated to cover future demands
- Continuous feedback loops to ensure ongoing input into the vendor-selection process
- On-line access for customers to lists of vendor products and services
- Strong partnerships with selected vendors that result in 90 percent of all purchases being made through a small number of contract vendors
- Electronically routed orders to reduce manual intervention (electronic operations include obtaining check fund balances, automatically posting lien funds, and routing for approvals—with preauthorization policies ensuring that the purchaser has proper authority)
- Discounts negotiated up front or based on volume rather than payment times (volume purchasing will enable UCSC to realize cost savings totaling $500,000 annually, and 90 percent of invoices will be paid within the time designated to receive maximum discounts)
- Order turnaround time reduced from 12 to 5 days

The new acquisitions process will provide better customer service while saving more than $1 million annually. This estimate includes approximately $500,000 in savings on goods and services and $500,000 in reduced staff costs. But the benefits extend well beyond cost savings. The new acquisitions process will focus on service and customer needs. For the first time, authorized end users—faculty and staff—will be able to request goods and services at their desktops at any time.

A critical element in the acquisitions process redesign is the development of a campuswide corporate credit card, a line of credit with vendors designed to accommodate the routine, low-value purchases that make up the bulk of the campus's purchasing activities. Authorized campus staff and faculty will use the credit card to buy low-cost items directly from vendors, reducing transaction costs by as much as 50 percent. For example, a maintenance worker needing a specific part can simply purchase it, minimizing delay to the job.

With the corporate credit card, no paperwork is involved; a magnetic strip encodes preauthorized purchasing limits with prenegotiated vendors. Those using the card will be trained in its use, and daily downloads of information will allow tracking by individual users. The credit card will be implemented in several campus pilot programs in January 1996. Additional cards will be distributed to authorized faculty and staff during the 1996–97 academic year.

The redesign of the acquisitions process included significant changes in the orientation, values, and work flow of the central purchasing department as well as the overall organization. The new design transformed central purchasing from a reactive paper-driven unit to a contract-negotiations unit, providing end users and units with discounted purchase contracts negotiated in advance. Through partnerships with selected vendors, the overall number of vendors was significantly reduced, yielding increased discounts.

The implementation process for the acquisitions team has necessarily included an ongoing comparison of the new financial information system against the new process and methodical adjustments to both. Once the off-the-shelf systems were fully analyzed, the team acknowledged that available systems fell short of their expectations. As of July 1995, the system has been installed, and the major components of the process changes have been implemented. Two more years of active implementation are planned as UCSC further improves system performance, simplifies processes, distributes system accessibility to more campus users, and implements the corporate credit card.

Technology alone cannot achieve the results needed. A new computer system would have merely accelerated a process that was riddled with redundancies. The redesign process, making optimal use of available technology, has made these changes possible.

CHAPTER 8

Changes at UCSC

Organizational Restructuring

The Creation of Service Centers

The most sweeping organizational change associated with QPM was made in the fall of 1994, when the campus clustered payroll, human resources, and financial and acquisitions functions into service centers. Each of these administrative groups was designed to perform a variety of duties in support of the units it serves. When this transition is complete (some consolidation is still pending), work once done by as many as 100 offices on campus will be performed by fewer than 30 service centers.

The new University of California payroll/personnel system and the development of the new financial information system on the UCSC campus made this change critical. The service centers consolidated many of the administrative functions of smaller units in order to promote effective use of on-line systems as well as use of frequent applications of related policies and procedures. With service centers, fewer employees need to be trained on the new systems, and employees at the centers can become more specialized and thus more knowledgeable about their tasks. Many business offices, such as the academic division offices, already functioned as service centers; their primary challenge was to adjust to the new computer systems.

Much like an accounting firm that handles the accounts of many small businesses, the service centers are responsible for the accurate and timely execution of decisions made by the units they serve. The key to the successful operation of these service centers has been a clear delineation between the responsibilities of the service center and those of the unit manager.

The service center manager is accountable for ensuring that policies and procedures are appropriately followed, that staff in the service center understand these policies and procedures, and that transactions are processed correctly. Unit managers retain the ultimate authority for their "businesses," ideally making sound business decisions based on information provided promptly by the service center.

Decentralization of Financial and Personnel Decisions

Another broad structural change delivered more authority, responsibility, and accountability to some unit managers. Managers in larger units, such as the Housing Services Unit and the Communication and Technology Services Unit, now have greater authority to make personnel decisions, including those concerning above-step hires, merit increases, reclassification actions, and leaves of absence. Many of the larger units now control their own budgets for funding personnel actions that result in permanent costs. This means, for example, that a manager must decide between reclassifying one employee and hiring another at above-step if the budget cannot accommodate both.

Small units, such as the Materiel Management, Police, and Fire Services Units, belong to spending pools that rely on vice chancellors to approve some of their personnel decisions. Even the heads of these smaller units have more autonomy than in the past. For example, they can approve temporary salary actions and the hiring of employees without recruitment.

This is a big change from the old system, in which state and registration fee funds were placed in a central pool from which all eligible units drew resources. Units needed approval from a vice chancellor for any personnel decision requiring permanent funding, even though the unit managers were the ones with immediate access to the information needed for good decision making. The traditional process also meant that there was little incentive for a manager to control his or her costs.

To help unit heads make these decisions, human resources staff, supported by the Planning and Budget Office, compiled a procedures manual that was distributed through briefings to the service centers in December 1994. The manual is a training tool and resource for service center staff who process personnel transactions and is designed to give service centers integrated bottom-line criteria for

organizing their units in preparation for the implementation of the payroll/personnel and financial information systems, including a checklist, principles for staffing and separation of duties, and workstation configuration requirements.

Additional Changes in Campus Technology

As UCSC moves its business operations on line, it becomes increasingly important for campus staff and faculty to be able to communicate with each other and access information via computer networks. Two efforts on campus—the development and documentation of computing standards and the establishment of a "warehouse" for information—are meeting these needs. In addition, UCSC is integrating the newly implemented University of California systemwide payroll/personnel system into its overall campus financial information system.

Campuswide Computing Standards

In summer 1994, a campuswide Standards and Support Task Force from the Communications and Technology Services Unit worked with a group of approximately 60 campus computer coordinators to draft standards for computers, printers, software, memory capacities, keyboards, and operating systems required to use the financial information, the payroll/personnel, the narrative evaluation, and the student information systems.

These standards, to be updated on an ongoing basis, will guarantee that campus units have access to mainframe databases and have the ability to exchange documents, spreadsheets, and electronic mail with other units that follow the standards. They ensure access to information services, distributed computing, and networking services that will be available in the coming years. Written standards will save the university money in support and productivity costs and in software and hardware prices. One software package, for example, dropped in price from approximately $200 a workstation to $22 with a volume discount.

Preparing such standards in an academic setting can be difficult. Any strict set of standards might limit innovation and the tendency of the most forward-looking units on campus to constantly update technology. The standards set must be flexible and as state of the art as possible. UCSC's standards are not rules, but recom-

mendations and guidelines for the campus. Once completed, the standards will be reviewed annually.

Data Warehouse Project

Developing a database that can provide historical "snapshots" of critical institutional data for comparative analyses is an important goal for all the University of California campuses. UCSC is engaged in a project that will provide integrated access to both historical information and current operational data from the campus payroll, financial, purchasing, student information, and campus facilities systems. Armed with these timely, on-line reports (available from the service centers), managers will be able to make informed strategic and operational decisions.

The data warehouse will be a major improvement over the former system, in which each unit kept its own records. Anyone trying to compile information across different units had trouble reconciling different dates, terms, and record-keeping styles. The Office of Planning and Budget has been assembling the data warehouse for more than a year, and the project is now being piloted. When complete, the warehouse will contain information on students, staff, and faculty, as well as data on facilities and budgets.

Because confidential personnel and student information is contained in the data warehouse database, access is limited. About 30 people—administrative and personnel analysts, computing directors, resource managers, and program analysts—are using the warehouse now. By fall 1995 it will be on line to about 75 users.

Payroll/Personnel System

Seven years ago, a group of employees representing all the University of California campuses started brainstorming improvements to UCSC's personnel and payroll system. Their goals, as outlined by the Office of the President, were to design an on-line system that would make more personnel information available and make its recording and retrieval faster and more efficient. The result of this effort is the new payroll/personnel system, on line in the UCSC Payroll Office in February 1995 and in widespread use on campus starting in September 1995. This was not a redesign project, but simply the creation of an information system to do work that had previously been done manually.

Payroll and personnel actions went through batch processing in much the same way as financial and purchasing actions. Employees filled out paper forms, obtained multiple approvals, then sent them in batches to be processed. Sometime later, the unit received reports showing that the action was carried out. Once the payroll/personnel system is on line, service center employees will enter the approved actions directly into the database and send messages electronically to a mandatory reviewer and to others who may need to know that the action was carried out. If their jobs require it, other employees will also be able to access the system. It will provide more comprehensive and useful reports and information, including a history of personnel actions taken since 1992.

Although it is an improvement over the current system of batch processing, the payroll/personnel system is not without its flaws. Designed to meet the needs of so many different campuses, the system is not as responsive to the needs of any single campus as its designers might have hoped. Although the University of California would have designed the program differently if today's technology had been available when the payroll/personnel system process began, the program represents a step forward.

Changing the Campus Culture: Old Versus New

Radical process change, such as that being made at UCSC, goes far beyond merely installing new software on office desktops. The campus is instituting technology changes, administrative process changes, and organizational structure changes. It is changing the way it approaches its most basic goals and how it assesses, manages, and rewards staff job performance. In other words, UCSC is creating a huge change in campus culture. Managing this cultural transformation is by far the most difficult and important element of any change effort.

"Shared values, beliefs, norms, and expectations develop within an 'internal culture' of an organization," says Richard Scott of the Paragon Consulting Group, the change management consulting firm that assisted UCSC in its cultural transition. Scott adds that changing a culture requires challenging these old assumptions, beliefs, and habits. In addition to training its staff on new systems, the campus needs to provide development and training opportunities for staff in other areas. "Most people want to learn and grow—they are open to change—and the organization has the tools to make that shift," says Scott.

Do not underestimate, as UCSC did, the cultural impediments to change. To begin with, any large institution resists change. The success of higher education in the United States has been based on the stability and traditions of its college and university system. However, the rigid and structured institutional cultures that once supported stability are not working in today's climate of rapid and accelerating change. To survive in this new world, both individuals and organizations need to learn to change. Higher education needs

to develop a culture that welcomes, seeks out, and thrives on ongoing change.

Many people resist change. Resistance to change stems from a basic human self-protective reaction, and changes in practice, procedures, or routines may undercut people's ability to perform. UCSC found that its organizational change efforts generated the following reactions in staff:

- Change in roles and tasks caused some employees—who had been effective and in control—to feel incompetent, needy, and powerless.
- Change in structure left some staff confused and uncertain about their new work relationships and their identity in the system.
- Change sometimes caused conflict between those who perceived they would benefit and those afraid they would not.
- Change sometimes created a sense of loss, even if it was perceived to be change for the better.

If staff are able to participate in the change process, they will feel more positive about it. A major change in institutional processes such as this should involve as many of those affected as possible; it will result in better processes, and everyone will feel more "ownership" of the changes.

One of the biggest changes resulting from UCSC's change effort will be sweeping new uses of information technology. In addition, redesigned processes that require less hands-on time will need fewer staff to perform them. This means that many people will take on new tasks. For example, while fewer staff may be needed to carry out actual business processes, more staff will be required for training and ongoing support.

Whether or not positions are cut in this process, staff members fear that the change may threaten their jobs or that they might not succeed at their new tasks. At UCSC, staff concerns about change included: Will I work at a computer all day? Will I have the skills required for the job? If not, will I be able to learn them?

Individual skills and confidence are not the only important issues of organizational change. Structural problems also block efforts to bring about change, and UCSC found that any new structure must provide clarity of roles, predictability, and some degree of security. New roles must prescribe duties and detail how work is to be

performed in the redesigned process. Clear new policies and procedures must support procedural and structural changes.

As the organizational structure becomes less hierarchical, work is done in different ways. Workers, who had before only entered data, are now empowered by new information systems to make decisions and complete actions. In addition, managers who once derived status from supervising many staff may find that the new, flatter organizational structure threatens that status.

The transition from an individual to a team effort is also difficult for some. Teamwork requires the integration of those with differing skills, education, backgrounds, and levels of motivation. Ultimately, the meshing of these diverse perspectives into a team strengthens the institution while at the same time making it more responsive and flexible.

A Cultural Baseline

In order to find out what potential cultural roadblocks UCSC's change effort might face, a consulting firm conducted an organizational culture inventory, a detailed analysis of the campus's existing organizational culture. The results were very interesting, documenting what many staff had already identified intuitively, and indicating that actual culture was at substantial variance with the ideal culture that the members of the campus community believed would contribute to organizational effectiveness.

The culture survey was conducted in six selected offices, with a priority on those most central to UCSC's planned organizational change. Those offices surveyed included Accounting, Planning and Budget, Communications and Technology Services, Human Resources, Purchasing, and one "user" office, the Humanities Division.

Overall, UCSC's cultural inventory analyzed survey feedback in terms of 10 basic cultural styles that combined different mixes of constructive, passive, and defensive styles and factored in elements such as need for satisfaction, people orientation, task orientation, need for security, and creativity. The analysis found UCSC's dominant styles to be "perfectionist" and "avoidance," styles with strong passive and defensive (as opposed to constructive) elements, low people orientation, and low creativity. The ideal campus culture, however, according to the surveys, was a strong constructive culture with strong people orientation.

The perfectionist culture is defined as one in which staff are directed toward narrowly defined tasks, avoiding error at all costs. The dominant organizational values are persistence, hard work, and the appearance of competence—not bad characteristics, but a focus on the appearance of perfection and hard work can cause people to lose sight of overall goals and risk becoming burned out. Creativity and adaptability to change are not rewarded; in fact, as error is an important part of the learning and change process, creativity is actually discouraged.

The avoidance culture has many of the same characteristics from a more negative perspective. This culture punishes errors, but fails to reward success. There is, therefore, no incentive to excel.

In addition, the survey found an unclear sense of campus mission and a lack of communication up and down the hierarchy. Such findings explain why members of the campus community often have low motivation, why goals are not met, and why they are dissatisfied with the current system.

The results of the survey helped UCSC's administration understand why it had difficulty changing the culture at UCSC. In the first two years following the identification of the need to change, the campus culture simply did not support the necessary changes. This experience taught UCSC that cultural impediments to change must be actively addressed; they will not change on their own and can, in fact, impair the change process.

Communication for Change

A critical element in facilitating cultural change is a strong communications effort to keep the campus community informed about the progress of the change effort. At UCSC, a BPR communications team was formed to communicate the reasons for the redesign process, to explain the process itself, and to provide an advance idea of what was to come. Ideally, the entire campus community would be aware of and excited about the changes planned and would have ample opportunities to be involved at some level.

As UCSC discovered through difficult experience, this communication program must be ongoing and consistent throughout the entire BPR effort. While the communication team functioned well in Phase 1 and at the start of Phase 2, it became less active as the Phase 3 efforts moved behind the scenes, becoming more detailed

and difficult to explain. As a result, many of those not directly involved with the BPR effort became detached from and disillusioned with the process because they were not aware of its progress.

Because the communication effort is so critical, it should be headed by someone familiar with the campus and closely involved in every aspect of the change process. Ideally, he or she should be a top member of the campus public relations or public information staff, someone able to translate the process effectively to the campus community.

UCSC began its communication effort by conveying a forceful message that radical organizational change was essential to the future of the campus. The administration then presented a compelling argument for change and a clear goal or vision statement on which to focus. Administrators developed a simple model for change that was distributed broadly through campus media, and they also visited units throughout the campus to make informational presentations.

UCSC Organizational Change Model

Old Organization	New Organization
Bureaucratic	Customer-service orientation
Vague mission	Compelling vision
Hierarchical structure	Horizontal structure
Complex work processes	Simple work processes
Paper-intensive	On-line, client/server
No staff training	Up-to-date training
Individual work	Team work
Error-prone work	Quality-driven work
Reward longevity	Reward performance

In communicating the need for change, it is important to be sensitive to the fact that it may be hard for some people to hear that the old culture does not work anymore. Many existing staff and faculty played a substantial role in creating the current campus organization, and both diplomacy and credibility are needed in communicating a clear case for the vision and the action. Communications to

the campus must be clear and easily understood. Those directly involved in the change process will get in the habit of tossing around acronyms and shorthand terms, but such jargon should be avoided in general campus communications. Using terms people do not understand will make them feel like outsiders.

Learning to Manage Risk

Moving to an administrative structure based more on accountability, bottom-line business practices, and ongoing change requires an approach to risk and risk management that is new to most academic institutions. In fact, it is a difficult concept for any large bureaucracy. While humans avoid risk, bureaucracies avoid it even more. In a bureaucracy, people are rewarded for taking as little risk as possible, but suddenly they are being asked to assess, understand, and take the risks inherent in effective business operations.

Substantial progress cannot be made without taking risks, but risk must be managed appropriately: assessed, accepted, and used to the best advantage. On both an institutional and personal level, one task in managing cultural change is to train people in risk management, and there are significant obstacles to overcome.

Simply put, UCSC needs to balance the cost of control with the cost of risk. For example, if data indicate that X employees will each steal an estimated $Y, with a total loss of X times Y, but that the estimated cost of the security needed to prevent all theft is 10 times the total loss, then clearly another solution, which does not cost more than the problem, needs to be found.

At UCSC, the issue of risk became a factor in the desire to have a completely open financial information system. The system selected has open architecture, but was originally intended for use in a smaller, centrally controlled environment. Distribution to a wider user base (as indicated by UCSC's vision) causes new difficulties to arise. While confidential information is protected, information considered sensitive by some (although still legally public information) is more easily available.

UCSC had to face this question: Is modifying the system to restrict access to sensitive information worth the cost? What will the costs be? Will people have to spend time justifying routine expenses that have been challenged by someone (internally or externally)? How much is this vision of an open system worth to UCSC?

Human Resources Implications

Because human resources practices are at the core of campus culture, this area has been a focus of change at UCSC. To allow the individual units to become responsive to customers and changing needs, UCSC needed to give them more responsibility and autonomy in personnel matters. Because jobs and roles were changing across campus, UCSC needed to have a more systematic and flexible training structure. To change the campus culture from one of avoiding error to one of pursuing excellence, UCSC needed to change the way it rewards staff performance.

At the core of addressing these needs have been shifts in personnel responsibility from the campus's central Human Resources Department to individual units. This is altering the role of the Human Resources Department from one of central control to one of support, training, facilitation, and consultation.

It was evident when UCSC began its change process that the existing framework of training provided by the Human Resources Department did not work. Investments in restructuring must be matched with investments in training. Process redesign has powerful implications for crucial skills. Planners must become more collaborative, computer analysts need new language skills, accountants need new computer skills, and so on. Yet UCSC had not invested adequately in the training and development of its work force. In fact, the recent budget cuts had resulted in large cuts in the training budget. The training budget was reinstated, and training opportunities were tailored to mesh with the needs of the change effort, but senior administrators are still working to provide comprehensive training curricula that maximize the skills and develop the potential of UCSC's staff.

Another area badly needing reform is the system of performance rewards and consequences. The compensation plan presently used throughout the University of California system is hopelessly antiquated and rigid. It provides no rewards for outstanding performance beyond regularly scheduled merit increases. On the other hand, there are few institutionalized consequences for bad performance; in fact, it might be unfair if there were, because the system for setting performance goals and expectations is ineffective.

UCSC is working to change this through structural changes such as establishing more concrete and quantifiable performance agree-

ments based on customer service and cost savings, "business plans" for managers, and—to encourage excellent work—very public one-time incentive rewards (with funds made available by the University of California system for this purpose) of up to 10 percent of salary. Last year 89 such awards were made throughout the campus administrative units alone.

In the BPR process, both during the active change effort and in the resulting restructured environment, special attention must be paid to who occupies the key positions in the new structure. Key roles are those that handle money or people in key administrative processes. In the new high performance organization, these need to be high-performing staff from inside or outside the organization.

UCSC has found that creating a balance of existing staff (who know the organization and can bring stability and credibility to the change effort) and new employees with new skills can be very beneficial for change. For example, it is ideal to have people involved who have been through a similar institutional change program elsewhere. They can bring their experience and perspective and remind team members that it really will work! A new perspective on old problems can work miracles as an organization seek new solutions.

On the other hand, some of the most successful staff in UCSC's BPR effort have been long-time staff with a lifetime commitment to the institution and a strong desire to see it change for the better. These staff are also the ones who will provide powerful models for the staff as a whole, winning credibility for the program.

CHAPTER 10

Lessons Learned

There is nothing more difficult to take in hand, more perilous to conduct, or more uncertain in its success than to take the lead in the introduction of a new order of things. Because the innovator has for enemies all those who have done well under the old conditions and lukewarm defenders in those who may do well under the new.

—Machiavelli, *The Prince*

The main lesson UCSC learned in this often arduous change process was that QPM does work! Change techniques from industry, such as TQM and BPR, can be successfully adapted to higher education, resulting in increased efficiency, significant cost savings, and better customer service. UCSC can also confidently say that, whatever the scope of an institution's change effort, it will be a much bigger task than can possibly be imagined—but the rewards will also greatly exceed expectations.

The success of UCSC's change process has been the result of incredible dedication from more than 100 staff members. They brought great enthusiasm to their task, although at times it took 50 to 100 percent of their time away from their regular jobs and meant that some levels of service were temporarily dropped. For these staff, the idea that their jobs might eventually make sense was an exhilarating and motivating force.

The Role of Campus Management

The good leader does not talk, but acts. When his work is done, the people say, "Amazing: we did it, all by ourselves!"

—Tao-te Ching, 500 B.C.

QPM requires the support of the entire campus leadership. In attempting to change a fairly large and complex institution like UCSC, consistent leadership has been the key to successful change. The campus leadership must provide vision, direction, enthusiasm, and resources. Clear communication of the campus vision and direction by the leadership—coupled with strong and visible enthusiasm for the process—can focus the entire community on a shared purpose and common goals.

Leadership is required to reduce fear of change, encourage open communication, push decision making to the lowest practical level, and build performance around systems that motivate people to grow. The campus leadership also needs to provide concrete support for the change effort in the form of funding. This includes a substantial reallocation of staff time and, in many cases, a sizeable investment in information technology. A clear mandate from top leadership will ensure that campus managers provide sufficient support (such as release time) for staff members working on the BPR process. The leadership also needs to be willing to effect appropriate organizational restructuring to drive the process.

As the organization changes, so do the requirements and definitions of leadership. Hence, as the management model changes, the leadership role becomes less one of control, becoming instead a force guaranteeing that the organization will continue adapting to new economic and technological environments.

The Role of the Change Agent

For this kind of widespread and comprehensive change to succeed, at least one top administrator must lead the way with an unshakable commitment to the process. In most cases, this person can be called a change agent; at UCSC the vice chancellor for business and administrative services filled that role. The vice chancellor's responsibilities have, of course, included directing the change process, but beyond that he has attempted to build a strong and permanent structure—cultural as well as organizational—that will be self-sustaining in the long term.

However, the change agent is not necessarily the implementor of change, or the final manager of a redesigned overall system. He or she must serve as a catalyst and build a structure for campus

involvement in the process and ensure that that structure becomes institutionalized to support ongoing change.

A key role of a change agent is generating enthusiasm and momentum for the change process, creating a situation in which others on campus, at all levels, have authority for sustaining change; in other words, creating a self-sustaining wave of change. For this to happen, the process of change needs to be broad, with enough key people invested with authority to keep things going.

Prepare Teams Well

An institution initiating change should provide for its early team members as much background information and training on the theoretical aspects of BPR as possible. Especially recommended is *Reengineering the Corporation* by Michael Hammer and James Champy.[7]

In retrospect, UCSC should have provided a more thorough overview of the whole process for its "pioneers." A case study of a redesign effort at another institution would have helped them see the big picture.

UCSC's BPR team members, especially team leaders, also needed more training in project management. They were being asked to schedule a complex series of activities, making the best of limited resources in a very limited time frame. For some, a lack of experience in this area led to frustration and lost time.

In addition, it is critical that those who step forward to become involved in the redesign effort understand the time commitment involved. During the most intensive work phases at UCSC, staff involved in BPR spent between 50 and 100 percent of their time on the project. It is also, of course, essential that the home units of these staff make appropriate arrangements for their absence, so concerns about undone tasks do not cause insurmountable stress.

UCSC also found that everyone needed to be flexible, fitting BPR or TQM teams to the task at hand. Different skills are needed at different parts of the process, and exactly what those skills are may not be clear until the task is actually underway. Teams should be flexible, with experts brought in as needed. For example, UCSC's financial process BPR team in Phase 2 was made up of a subset of the original Phase 1 team, with the addition of staff having the technical expertise required for the information technology selection process.

Do Not Underestimate the Culture

A major lesson UCSC learned is that it is harder to change an organizational culture than it is to implement changes in administrative processes. Not all campus staff were as enthusiastic about change as the core BPR teams, and the BPR teams met with resistance as people reacted with fear to possible changes in their work structures and roles. UCSC learned that a conscientious effort must be made throughout the change process to promote cultural change. This must, above all, include a strong and consistent communications program for the campus community, the recruitment of key people who will further cultural change, the provision of retraining necessary to make people feel secure in their new roles and structures, opportunities for staff involvement, and encouragement of the community's active input.

The vision for change needs to be communicated consistently and at all levels. Staff need to hear the same message from the chancellor, the vice chancellors, and their own managers. The biggest problems UCSC had were when its communication program lapsed or when contradictory messages were sent. Communication and attention to cultural change must be maintained, even when other elements of the change process are paramount. For example, because of the intensive nature of implementing a new computer system at UCSC, there was a period during which that activity took primary focus. The challenge is to continue integrating all aspects of change management during these busy times.

On the other hand, excessive enthusiasm can also cause problems. An excited core team of people working on a BPR effort can became a subculture itself, with its own jargon and an almost religious fervor about its mission. Those not on the "team" may feel excluded by this group that seems to be so "in the know." In other words, it is important to maintain an open process, encourage involvement, and avoid using jargon that the broader campus community may not understand. The process will benefit enormously from broad participation and buy-in.

Finally, as mentioned earlier, it is easier to have a vision than to get a financial information system that will support it. There will inevitably be compromises in this area, but that should not discourage change leaders or derail the process. A vision is a guide, something to strive for. Institutions should create the vision they want

and get as close to it as they can—then continue striving to close the gap.

Conclusion

Whenever a new discovery is reported to the scientific world, they say first, "It is probably not true." Thereafter when the truth of the new proposition has been demonstrated, they say, "Yes, it may be true, but it is not important." Finally when sufficient time has elapsed to fully evidence its importance, they say, "Yes, it is important but it is no longer new."

—Michel de Montaigne, 1533–1592

What will UCSC look like by the year 2000? There are some likely elements if UCSC continues its work in laying the groundwork for an improved administration focused on quality. Listening to the voices of its customers will be second nature for UCSC, and the institution will gather their feedback on a regular basis. UCSC's administrative ranks will be smaller even as numbers of faculty and students increase. Its senior management will spend more time setting vision and strategic direction and less time rechecking redundant processes.

By the year 2000, most or all of UCSC's internal and external "commerce" will take place electronically. The campus will pay its employees and vendors using electronic fund transfers, and electronic data interchange will simplify the many financial, acquisitions, and other processes that link UCSC's units and connect the campus as a whole with University of California Office of the President, other campuses, customers, external trading partners, and agencies. The exchanges of funds with students for loans, fees, events, housing, and other services will be facilitated through credit and debit cards. The focus of university financial operations will be on the elimination of intermediaries and the creation of the utmost efficiency in handling transactions of low dollar value.

In the future, those responsible for recording and classifying financial transactions or requesting and ordering goods will enter information just once into a central campus information system. The timeliness and accuracy of financial transactions and purchases will be enhanced by the use of automated edits, standards, routings, and

on-line approvals, and the flow of processes will be highly automated and simplified. Daily transaction information will be accessible to authorized employees in a manageable form. Similarly, summary information needed for planning and management purposes will be available at different levels of summarization and frequency, according to the information user's needs and authorization.

Campus administrative systems and processes will facilitate localized business decision making, while providing campus and system leaders with the meaningful and timely information needed to manage in uncertain and rapidly changing times. The role of central campus offices such as accounting, purchasing, budget, and audit will be as consultants, advisors, and trainers enabling the work of managers and staff and assisting with more complex transactions and interrelationships.

UCSC's staff will have "earned authority" through frequent and regular training and will be held accountable for their work. UCSC will have realized improvement in all critical measures of performance. The institution will reward performance as well as individual and team-facilitated contributions to unit and institutional goals. And it will reduce costs significantly as it remains committed to its mission to deliver high-quality education, meaningful research, and service to the next generation of Californians.

Notes

1. *The Economist*, 15 Aug. 1992, 18.
2. Peter M. Senge, *The Fifth Discipline* (New York: Currency/Doubleday, 1990).
3. Michael Hammer and James Champy, *Re-engineering the Corporation: A Manifesto for Business Revolution* (New York: Harper Collins, 1993).
4. Ibid., 104
5. Roger Von Oech, *A Whack on the Side of the Head: How to Unlock Your Mind for Innovation* (New York: Warner Books, 1983).
6. Joel Arthur Barker, *The Business of Paradigms*, video (Burnsville, Minn.: Chart House International Learning Corporation, 1990).
7. Hammer and Champy, *Re-engineering the Corporation*.

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